HYGEIA

A JOURNAL OF INDIVIDUAL AND COMMUNITY HEALTH

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IN THIS ISSUE

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Our Favorite Murderer!

The Danger of Measles

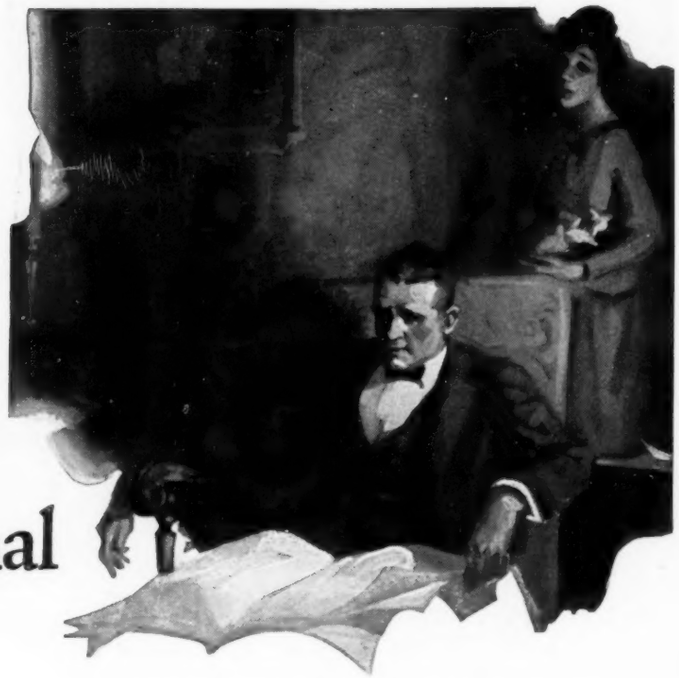
The Nature of Cancer

Patent Medicines

Plain Facts About Health and Disease

Health News of the Month

May, 1923 — *25 Cents*



Persistent Pain is your danger signal

Are you one of those persons who believe they can "wear out" an ailment?

Such a practice often leads to disastrous ends, as in the case of a man who was proud of his "stolidity."

He had experienced recurring pains in his side and each time tried to "talk himself out of them."

Various home remedies were tried without success. Eventually the pain grew so intense that the sufferer called in a physician. The doctor diagnosed the case and discovered the shocking fact that the patient was suffering from a disease which had progressed to a state where it was too late to operate.

Had this unfortunate man heeded the danger signal of recurrent or persistent pain, and followed the sensible course of consulting his doctor at once, the ailment could have been taken in its early stages when it yields most readily to treatment.

How many times have you seen people allow chronic disease to develop by neglecting the danger signals of minor pain? Don't deceive yourself—see your doctor at the first sign of illness. His life's work is to know danger signals and symptoms.

It is easier to *keep* well than to *get* well. Be examined at frequent intervals by a good physician. Always consult him when in the least doubt about ordinary sickness. This is the best method of preventing the development of chronic disease.

Show this announcement to some relative or friend who you think would appreciate your thoughtfulness.

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Photographed by Arthur J. Cramp

The Spring is here—the delicate footed May,
With its slight fingers full of leaves and flowers,
And with it comes a thirst to be away,
In lovelier scenes to pass these sweeter hours.

—N. P. Willis.

Hay Fever: The Early Spring Type

I. CHANDLER WALKER

BOTALLUS of Pavia was the first medical writer to mention, in 1565, patients with headache, itching of the nose, and sneezing from the odor of roses, and during the following hundred and fifty years several writers made mention, as medical curiosities, of patients with catarrh and asthma just at the time of the blooming of roses. But not until March 16, 1819, when John Bostock, an English physician, described his own symptoms in detail, was hay fever recognized as a clinical entity. Bostock describes a sense of heat and fulness in the eyes, with subsequent itching, smarting, and sensitiveness to light, and later severe inflammation and copious discharge of a thick mucous fluid. The irritation in the eyes was followed by more general symptoms, fulness in the head, irritation of the nose, which produced fits of sneezing of extreme violence at uncertain intervals, sensations of tightness in the chest, difficulty in breathing, a feeling of want of room to receive the air necessary for respiration, a great deal of languor, emaciation, restlessness at night, and incapacity for muscular exertion. The symptoms appeared every year about the beginning or middle of June, and the acute symptoms disappeared about the end of July, but the weakness and languor were felt for a month or six weeks longer. Medication gave no relief. Avoidance of moist and close air and of bodily exertion seemed to prevent the more severe symptoms. During an unusually warm season when Bostock remained nearly confined to the house for about six weeks, he had less severe symptoms than he had had for several years. Nine years later in a more detailed account, Bostock used the name "summer catarrh" and mentioned the name hay fever, which had been in common use for several years. More than a century ago therefore there was published an excellent description from the medical point of view and from the subjective point of view of the symptoms of hay fever, and the condition was recognized as being distinct, although the cause was not known.

I. CHANDLER WALKER, M.D., has been making a study of asthma and hay fever for the last ten years. Those unfortunate persons who at the uncurling of the first leaves and the blooming of the trees must cry and sneeze when most of us are happy will be particularly interested in Dr. Walker's paper on the causes of the early spring variety of hay fever. The second, the early summer variety, and the treatment of all varieties of hay fever will be discussed by Dr. Walker in later issues of HYGEIA.

First Suspicion of Pollens of Flowers

The common name hay fever shows that the public supposed the disease was produced by hay fields, but by various writers it was attributed to hot houses and to the aroma of flowering grasses. John Elliotson, in 1830, was the first to suggest that the condition did not depend on hay, but on the fresh flowers of grasses, and probably grass pollen. Charles H. Blackley, a physician in England, who was subject to hay fever, experimented on himself in the period between 1856 and 1877 with the pollen of more than a hundred grasses and flowers, by inhaling the pollen, by applying it to the mucous membranes of the nose and eyes, by rubbing it into the scarified skin of the arms and legs, and in many other ways. He found that in his own case all pollens caused symptoms of hay fever, but that the pollens of the grasses produced these effects in an extreme degree. By means of glass plates covered with a sticky fluid, he demonstrated the presence of pollen grains of various kinds in the atmosphere, and he observed that in his own case the intensity of the symptoms became more or less severe in proportion to the increase or decrease in the amount of pollen in the air; 95 per cent. of all pollen grains on his plates were found to be those of grasses. Very little pollen was found in the air of a closed house, and there was ten times as much pollen in the air in the country as in the air of the city. These experiments were repeated and elaborated by Dunbar, who separated the protein content of the pulverized pollen grains from the starchy residue; he found that the starchy fraction did not produce any effect when applied to the mucous membrane or the scarified skin of patients who had hay fever at the time of the flowering of the grasses, but that application of the whole pollen to the mucous membranes caused all the symptoms of hay fever, and that the protein extracted from the grass pollen brought on the symptoms in a more intense form. Neither the whole grass pollen nor the protein extract had any effect on normal persons. Therefore, by experiments

Blossom of the scarlet oak. The oaks pollinate from March to June, according to the variety and the climate; they are most troublesome as a cause of hay fever in the east and middle west.

on their own itching and discharging eyes and noses, physicians who themselves were sufferers from hay fever established the relationship between the clinical symptoms of hay fever and the contact with the pollens to which they were sensitive, and furthermore, that it was the protein of the pollen which acted as a poison to sensitive persons.

Pollens Carried by Insects and by Wind

As everybody knows, all flowering plants have their origin from a single cell within the seed. This first cell of the new plant is the result of the fusion of two entirely separate cells, the pollen grain and the egg cell, which correspond in function and to some extent in structure to the spermatozoon and ovum of the animal kingdom. In most plants, both the pollen and the egg cells are produced within the same flower, but the self fertilization of the pistil, which contains the egg cells, by the pollen from the stamens of the same flower is prevented as a rule, while elaborate measures insure the transportation of pollen from the flower in which it grows to other flowers on plants of the same species at a distance. The two chief agencies for the carrying of pollen are insects and the wind.

The pollen grain is a cell, usually nearly spherical, with a tough outer membrane and simple cell contents. In plants which are pollinated by insects, the amount of pollen is small in comparison with the clouds of pollen thrown into the air by wind-pollinated plants. By the bright colors of the flowers, by sweet and penetrating odors, by nectar secreted from glands deep within the flower, insects are attracted to certain flowers; the mature pollen is brushed off by the bristles that grow on the head and thighs of the visiting insects, which then fly with the load of pollen to other flowers.

Since the amount of pollen produced by insect-pollinated plants is small, and since the pollen grains are often heavy and sticky and are not discharged into the air, this type of plant rarely produces hay fever unless the sensitive person comes into contact with the flower, actually smells of it, or carries it in a bouquet. These contacts with flowers that cause symptoms of hay fever can be avoided, and for this reason it is seldom necessary to give treatment for hay fever produced by insect-pollinated plants.

In contrast with plants that are pollinated by insects, the wind-pollinated plants bear very numerous, small, and inconspicuous flowers, which rarely if ever are provided with nectar glands. By the appearance of the flowers, therefore, one can tell the manner of pollination of a plant and predict with considerable accuracy whether or not the plant is important as a cause of hay fever. As a result of adaptation to the method of wind pollination, the flowers, usually numerous, produce pollen in enormous amounts to allow for the waste of pollen in spreading the grains thickly enough through the air to insure the sprinkling of pollen on flowers of plants of the same kind growing at a distance. The size and weight of the mature pollen grain is fairly constant for any given type of plant, and it is so small that the naked eye can barely see it as a speck of dust, although if the spike of a wind-pollinated

Blossom of the soft maple. In portions of New England and the states east of the Rocky Mountains the maple causes grief to the victims of hay fever.

plant is jostled just as the pollen is ripe for shedding, the pollen can be seen rising as a little cloud. The pollen of the common dwarf ragweed is about twice the diameter of a red blood corpuscle, and consequently it is so light that it can be blown to a considerable distance, and it is produced in such quantities that it is borne on the air near the plant in a cloud, and powders the shoes of the passerby with yellow dust.

Wind-Blown Pollens the Greater Culprits

Although any one of a large number of plants to which a patient is exposed may be a potential cause of hay fever, in reality only the plants that shed great quantities of light pollen which can be carried to a distance by the wind are common causes of hay fever. Since the wind-borne pollen is present in great abundance in the atmosphere, sensitive persons may have hay fever from the wind-pollinated plants without coming into direct contact with them. Rare plants, plants which grow on mountain tops or deep in the woods, remote from the centers of population, insect-pollinated plants, and those producing only small amounts of pollen cause hay fever only by direct contact with the flowers. Treatment with the extracts of the pollen of these plants is usually not necessary because the patient can avoid them; for the hay fever caused by pollens which are inhaled with the air and cannot be avoided, treatment should be given.

The Proteins of Pollens the Poison

The many kinds of pollen suspended in the air during the flowering season are breathed by all persons, and most persons can inhale pollen even in large amounts so that it is blown out yellow on the handkerchief, with no more irritation than would be produced by breathing any other dust. But to sensitive persons the pollen acts like a poison; introduced into the eye, it causes smarting, tears, and swelling; into the nose, a swelling of the mucous membrane and a profuse discharge; and into the bronchial tubes, in addition to the swelling of the mucous membrane and the discharge, contraction of the muscles causing the shortness of breath of asthma. Pollen on a scratch on the skin causes redness, itching, and swelling, and pollen injected into the body may cause general reactions of hives, catarrh, or asthma. Pollen is specific in its action and affects only persons who are sensitive to it. Every species of animal and plant produces its own specific protein, and to some extent even different tissues have each a peculiar protein. Thus patients with hay fever may show a wheal when the pollen to which they are sensitive is moistened on a scratch on the skin, but no effect will be produced on the skin by the proteins of the stem, leaves, or seed of the same plant. Plants that are closely related must have almost the same protein in the pollens, because a patient who reacts to one pollen often shows a distinct effect from the pollens of plants that are closely related, and the strength of the reaction might almost serve as an index of the closeness of the plant relationship. Since each kind of animal and plant has its own specific protein, proteins of outside origin are foreign and usually harmful to the organism. Foreign protein does not normally enter the body until it has been split by digestive ferments into simple substances, like the amino-acids that are not toxic, which are suitable for absorption by the tissues. It is supposed that the mucous membranes of persons who are sensitive to pollens or other proteins are more permeable than those of normal persons, and that the protein passes through the membrane with less change than is needed to render it harmless. In this way the patient becomes sensitive to a specific foreign protein or proteins, and after once becoming sensitive, he is affected by amounts so small as to be harmless to a normal person.

The blossom of the box-elder in the canyons of Colorado is recognized as the enemy of persons subject to hay fever.

Specific Pollen Determined in Treatment

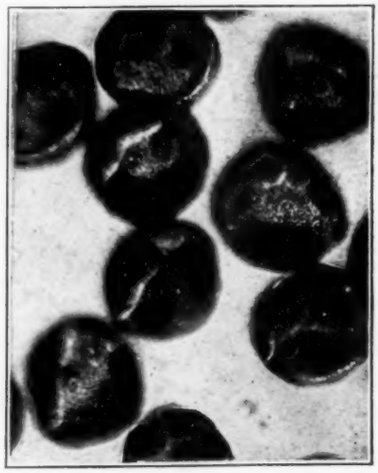
In the treatment of hay fever, the specific pollen to which the patient is sensitive must be determined by skin tests with the pollens in the air during the period when the patient

has hay fever. A careful history of the seasonal occurrence of the hay fever usually shows a close correspondence between the time of hay fever and the season of pollination of a plant or group of plants that is known to be a frequent cause of hay fever in the locality at that time of year. Since the flora varies greatly in various localities and with the seasons, a physician who treats hay fever needs to know those plants which are most common in the region where his patients live, which plants are wind pollinated, and at what time their pollens are shed. In securing this information, the cooperation of a field botanist who knows the region is of value. From the groups of plants which are probable causes, the particular cause can be determined by learning from the skin test to which one the patient is most sensitive.

Pollen of an elm, magnified 500 times. Such are the causes of hay fever.

Pollen of a pine, greatly magnified, in a fixing solution, showing the "wings."

(Courtesy of Lea and Febiger.)



Pollen of the black walnut with characteristic markings, magnified 500 times.

Tree Pollens the Offenders in Spring

In New England there are three distinct hay fever seasons which correspond to the periods of pollination of the groups of plants that commonly cause hay fever in that section of the country. The first or early spring hay fever season extends from the middle of March to the middle or last of May, and in late seasons through the first week in June. About the middle of March pollen is shed by the hazelnut and witch hazel, late in March and in April by the willows, the poplars, junipers, maples, birches, and elms, and in May by the sweet ferns and bayberries, ashes, oaks, sycamores, hickories, walnuts, alders, and the various fruit trees, and late in May and early June, by the pines. Since the tree pollens are present in the air at this time, and patients are found to react to the particular trees in pollination during the period of the hay fever symptoms, the principal cause of very early spring hay fever in New England is recognized as the pollens of trees. Cases of this very early spring hay fever are comparatively rare, and since the symptoms are present for only from three or four days to two weeks, at most, according to the length of the period of pollination of the various trees, it is not essential, except in isolated cases, to treat with tree pollens.

New England States

The tree pollens to which patients in New England most commonly give reactions and which most commonly cause hay fever are the willow, poplar, and maple. If the patient is sensitive to several trees pollinating one after the other, his period of early spring hay fever may extend for several weeks and be extremely difficult to treat because the symptoms are caused by several pollens acting in succession. The flowers of the willow are provided with nectar glands and pollinated chiefly by insects, but the pollen is produced in large amounts and it can be disseminated from the catkins to persons within a restricted area about the trees. The pollen of the common fruit trees is insect borne, and since the pollen is produced in small amounts, only those who are sensitive and who must work in orchards during the flowering period need treatment with these pollens. Pine pollen is disseminated from pine forests on certain days in the spring in such quantities that lakes are covered with the yellow dust and ships' crews have found the pollen out at sea a hundred miles from the coast of Norway. The granule of pine pollen bears at opposite ends on one side two air sacs, which probably buoy up the grain and make possible the transportation to great distances by the wind.

West and Southwest

Outside the New England states, the flora and the seasons of pollination vary so much for

each district that only by field studies can the plants that most commonly cause hay fever be determined in each locality. Such intensive study of hay fever plants has already been carried on by Dr. William Scheppegrell in New Orleans, and by Dr. Harvey M. Hall for the region west of the Rocky Mountains, and to some extent the flora has been studied in Oregon, Texas, and Arizona. Most of the statements in this paper about the hay fever plants of the southwest are drawn from Dr. Hall's report. Of the alders which pollinate in California from January to April, the red alder, *Alnus rubra,* restricted to the coast from Santa Barbara north, produces a positive reaction and may cause hay fever in some patients; the other variety of alder, restricted to stream banks among the hills, is of only local significance. The white birch, which is a common street tree, several planted varieties of birch, and a form found sparingly in the mountains, have been known to produce a positive reaction on hay fever patients and may be an occasional factor in early spring hay fever. The pecan, occasionally grown in yards and orchards, the chestnut, and the giant and bush chinquapin, which pollinate in succession through the spring and early summer into July and August, are not known to cause hay fever. The hazelnut, which produces pollen abundantly from January to April, grows in regions too remote to be a menace. The California black walnut (*Juglans californica*), which pollinates abundantly in April, May, and early June, is an important cause of early spring hay fever because it is grown commonly in yards, streets, and parks for shade and ornament, but since the pollen grains are fairly large and are not carried far by the wind, the area affected cannot extend far from the trees. In describing California black walnut pollen as a cause of early spring hay fever, Dr. Hall says:

> The abundant pollen sifted down over the city just at the time when the disease was most prevalent, and the disease disappeared soon after the close of the flowering period. When patients left the region temporarily to escape the disease they were free from symptoms, except when passing through towns where the black walnut grew. Positive reactions were obtained with extracts prepared from the California black walnut pollen. The intradermal tests were verified by direct application to the nostrils and the well known symptoms of hay fever were immediately produced in each case.

As a means of controlling the black walnut hay fever, Dr. Hall suggests the grafting of the tops of the trees with branches of the eastern walnut which is not yet known to be a cause of hay fever, but this measure is so laborious as to be almost impracticable. The oriental plane tree or sycamore, a street and park tree common in the cities of California, pollinating from February to April, the Freemont cottonwood, the common cottonwood of river bottoms and canyons, and various other species of poplar grown as ornamental trees, may be occasional causes of hay fever during their periods of pollination. The coast live oak (*Quercus agrifolia*) of coastal regions north from San Francisco sheds abundant pollen in the spring, but as a cause of hay fever its area may be restricted. Several species of elm are grown as street trees and cause a mild form of early hay fever. Patients have been known to react to the pollen of willow, of which there are many varieties in California, but since the pollen is carried chiefly by insects, it is probably an infrequent cause. The orange (*Citrus sinensis*) is commonly believed to be a cause of early spring hay fever, but since the pollen produced is scant and heavy, and the navel orange produces no pollen, it is almost impossible for the orange to be a cause of hay fever, and the cases supposed to be due to orange trees must really be caused by the pollen of spring grasses or black walnut.

Blossom of the white elm. Varieties of the elms are among the less important causes of hay fever from Newfoundland to Manitoba, Texas and Florida.

In the southwest the climate is subtropical, with a pollinating season of nine months, and large areas under irrigation are not intensively cultivated so that weeds grow profusely. Dr. E. W. Phillips writes:

> In Arizona, the lack of rainfall allows pollen to stay in the air for a long time and still longer in the dust. The number of pollen sufferers is large; those sensitive to one pollen at the outset acquire multiple sensitization in time; pollen asthmatics from the east become affected by local plants after a breathing space of two or three years; and as population and irrigation increase, so does the amount of pollen in the air and the number of those made ill by it. Those with multiple sensitization have continual

trouble for nine months, and some have practically no free period. There are at least three hay fever seasons in Arizona; in some places they are separated; but in the irrigated country they overlap. The first is caused by shade trees, mainly the cottonwood (*Populus macdougali*) and the Arizona ash (*Fraxinus attenuata.*) In the region under discussion they begin to pollinate early in February and their pollen is in the air until about April first.

In Texas very little has been done to define the hay fever localities, the time of occurrence, and the duration of the disease in each locality. A form of winter hay fever, making its appearance annually in certain parts of Texas between the middle of December and Christmas and

Pollen from the blossoms of the cottonwoods in the east and west gives positive reactions in patients with hay fever. The reaction from the western cottonwoods is more severe than from the eastern.

lasting until the middle of February has been described by Dr. Sam N. Key. Since the disease comes in midwinter it is frequently mistaken for a persistent cold, but it has all the characteristic symptoms of hay fever, and is not affected by freezing weather. It was found that the only pollen in the air at that time, as shown by the pollen grains collected on specially prepared plates exposed in various places, was that of the male tree of the mountain cedar (*Sabina sabinoides*). During the winter the male cedar is made conspicuous by the brownish tint that the cones containing the pollen give to the tree. When pollination is once begun, enormous quantities of pollen are given off until the end of January, and then the amount gradually diminishes until the middle of February when the trees are practically free. "During the pollinating period, when a susceptible person comes within the pollinating radius of the tree, an attack of hay fever is induced. The pollen of the cedar being small, it is capable of traversing considerable distances. By Christmas the pollen in the air has reached sufficient concentration to produce the hay fever reaction in susceptible persons living where mountain cedar is abundant." In sensitive persons the inhalation of the mountain cedar pollen was found to produce the symptoms of hay fever, even at times when the tree was not in blossom, and the skin reactions were positive in these patients. The winter hay fever may be entirely avoided by going to some locality where the mountain cedar does not grow. Mountain cedar is found over a considerable portion of Texas, and even in Mexico and New Mexico.

East of the Rockies

For the area of the United States east of the Rocky Mountains, Scheppegrell in his list of hay fever plants mentions the elms (*Ulmus americana* and *U. alata*), the cottonwoods (*Populus deltoides* and *P. angustifolia*), the swamp poplar (*P. heterophylla*), the aspen (*P. tremuloides*), the black willow (*Salix nigra*), the white ash (*Fraxinus americana*), as causing hay fever locally wherever the trees are found in abundance.

The box-elder (*Acer negundo*) causes hay fever in the canyons of Colorado where it is common.

Throughout the United States

From this discussion, it may be seen that quite commonly throughout the United States during early spring, from January through May, according to the locality and the forwardness of the season, there is a form of hay fever, usually with mild symptoms and of short duration, which is caused by the pollen sifted into the air by the blossoming trees. In many trees the flowers develop and may even go to seed before the appearance of the leaves. The flowers may be inconspicuous, as in the elms, or very prominent on long and showy catkins. In persons who are sensitive to only one kind of tree pollen, the symptoms last only a few days, but persons who are sensitive to several kinds of tree pollen may have one long attack throughout the season, or, as is more commonly the case, several short attacks with pauses between, depending entirely on the times of pollination of the trees to which they are sensitive. Usually the symptoms are too slight and of too short duration to require treatment with extracts of the pollens to which the patient is sensitive, and in cases of multiple sensitization to several trees, treatment is very difficult at best.

Our Favorite Murderer

SAMUEL HOPKINS ADAMS

SOME weeks ago, a boy wandering in a southern wood patch was bitten by a poisonous wild creature and died. The press associations disseminated the startling fact to all parts of the country, where it appeared in headlines as part of the sensational news of the day. In the same month and the same state twenty-odd persons, bitten by another variety of poisonous wild creature, died as a result of the bites. Except for local notice, the newspapers paid no attention to these deaths. The one victim about whom all the fuss was made was killed by a rattlesnake; the many were killed by mosquitoes. The first was a news event of magnitude because the rattlesnake has a hold on the popular imagination. The other tragedies passed practically unnoted because we have become apathetically accustomed to the mosquito, which is, in bulk, thousands of times more harmful and dangerous than all the snakes and other wild creatures in the United States put together. The potentially deadly pest is familiar and tiny, and therefore unimpressive. We continue to endure it supinely, almost fatalistically. If the venomous little buzzer had the unpleasant personal appearance, for example, of the tarantula (which probably never killed an able-bodied person in its history, despite its horrific repute), there would hardly be enough of the species left to provide the museums with specimens. As it is, we gladly suffer the mosquito; we welcome it into our houses through unprotected windows; we feed it on our blood; we transport it in our automobiles from places already infested to places hitherto free; and we provide suitable breeding places for it privately in our back yards, at municipal expense through open drains, or even by special state or federal enterprise, in the form of unprotected irrigation water. It is not too much to say of the mosquito that it is our favorite murderer.

SAMUEL HOPKINS ADAMS, editor and author, has long been interested in social work and health work. This article might be called an exposé of man's tolerance of one of his enemies, and even passive encouragement, to continue to torture, cause illness, or kill during the warm months of the year.

Two Species of Mosquito Produce Disease

About one hundred species of mosquito inhabit the United States. Most of them are readily susceptible of domestication, and can be brought to feed from the hand, or other convenient and exposed portions of the body, without trouble. As direct producers of disease, only two are of major importance: *Anopheles*, which carries malaria, and *Aedes*, which in earlier years transmitted yellow fever (until rigid quarantine and scientific mosquito control eliminated the disease from our territory), and which still disseminates the painful and disabling dengue. Besides these, there are the vast broods of marsh and swamp mosquitoes, drain, rain-barrel and tin-can hatched mosquitoes, and woodland mosquitoes which, without producing any specific disease, are a general detriment to comfort, and by lowering vitality through loss of sleep, local poisoning, and nervous irritation undoubtedly contribute indirectly to our total sickness and death rates.

Economic Waste of Malaria

Against the malaria-bearing *Anopheles*, the capital indictment is definite and more than sufficient. The census for 1920 shows three thousand one hundred and thirty-six deaths from its bite for the registration area, indicating a total for the whole country of about five thousand. This is half as many as from the dreaded but steadily diminishing typhoid, and a quarter as many as from diphtheria, the most deadly of the epidemic diseases. From the purely economic point of view, malaria represents a greater loss than either of the other diseases, both because of its vastly greater prevalence and because of the longer period of disability due to it. Dr. Carter of the United States Public Health Service reckons that for every death from malaria there are nonfatal cases each aggregating from two thousand to four thousand lost work days. This would give, at the lowest estimate, ten million work days yearly forfeited to *Anopheles*, or, to put it in a form more easily reckonable, the labor of five thousand men for nearly seven years. What project now under way or in prospect in the United States could not be completed several times over with this labor force, now wasted?

Successful Campaigns for Eradication of Mosquitoes

Waste it is, sheer, inexcusable waste, which in many parts of the south permits from 40 to 60 per cent. of the populace to become dis-

abled for longer or shorter periods every year, and in a few localities close to 100 per cent.; for all this illness is theoretically and nearly all is practically preventable. This has been proved in many experiments, some in the most unfavorable possible localities. An example is the attempt of Roanoke Rapids, North Carolina, a mill settlement with a shifting population of about four thousand, to do away with the mosquitoes. During the four worst months of the year, the mill operators believed that they were doing as well as could be expected if they achieved 50 per cent. efficiency. The other 50 per cent. was checked off to malaria.

This swamp furnishes a happy home for mosquitoes. The people living near would probably be a healthier, happier lot if it were drained.

Physicians employed by the companies averaged fifty malaria calls a day. Partly as a humanitarian, partly as an economic measure, the mill owners combined in a campaign to exterminate the mosquito by drainage and oiling, although with grave doubts as to the economic results. Those doubts were resolved in the first year when, at a cost of eighty cents per capita of population, medical calls were reduced from fifty to two and one quarter a day. At the end of the second year there was not a case of malaria in the place except those cases which came in from outside mosquito preserves, and the mill efficiency ran close to 100 per cent. The mill authorities now figure that a conservative estimate of their saving is ten dollars for every dollar expended in the campaign.

Crosset, Arkansas, is another locality which has shown *Anopheles* to be a luxury rather than a necessity. In 1915, it had a population of two thousand persons and a record for the year of two thousand five hundred malaria calls. The Rockefeller International Health Board put into execution there its plan of irrigation control. Three years later the total of ascertainable cases of malaria in the town was twenty-five. Not far away the location of Lake Village, Arkansas, in the midst of a cedar swamp presented a problem of special difficulty. In 1916, there were two thousand persons there, of whom one thousand eight hundred were known to have suffered disabling attacks of malaria in the course of the year. At the conclusion of the Rockefeller board's second year of work, the number had dropped to eighty-three for the year. What was done there can be accomplished anywhere. Yet the swamp lands of the south—and not the south alone, for there are instances in New York, New Jersey, Pennsylvania, the New England states, and the middle west—can furnish lamentable instances of factory sites abandoned, real estate projects aborted, homes deserted, and population stationary or dwindling because of the depredations of the winged poisoners. To find a parallel, one must range as far as India, where villages have reverted to jungle through terror of those other beasts of prey, the tiger and the python. Certainly there is nothing to set beside it in civilized America. Even from pioneer days, there are no records of mankind being permanently evicted by the rattler or the prairie wolf. Alone among wild creatures the genus *Anopheles* may claim to have conquered the genus *Homo*.

The war cantonments proved how thoroughly the mosquito could be eliminated. To the surprise and, for a time, to the dismay of entomologists and medical scientists, many of the camps were located in sections known to be malarious. But the Army Medical Corps within the camps and the United States Public Health Service in the adjoining country so effectually attacked the problem that the hospital admission rate for malaria, which in the Spanish-American War rose to about 70 per cent. in the southern camps, was held to less than 1 per cent. Most of the cases comprising the 1 per cent. were attributable either to the very early days, or to the mosquito bites sustained while on "hikes." Not once in the course of my stay at the Medical Officers Training Camp, Camp Greenleaf, near Chattanooga, did I see or hear a mosquito, although it was the height of their season. There was a general and almost superstitious belief in camp that if one were ever discovered and reported, "the Old Man (meaning Colonel Munson of the Surgeon General's staff, who was commanding officer) would raise more hell with somebody than if a German spy had sneaked in." Certain it is that such other camps as I visited were remarkably free not only from mosquitoes, but also from flies, and the educational effect of the cleaning-up which the nearby localities enjoyed is still a valuable element in the antimosquito campaign.

Organizations for Extermination

Dr. L. O. Howard, chief of the Bureau of Entomology, United States Department of Agriculture, and the recognized American authority on mosquitoes, declares that he has never

seen a city in this country which could not readily and economically be freed of the pest and kept free. If the infesting mosquito is *Anopheles,* the cost of extermination would soon be recouped in saving on physicians' and druggists' bills, and the economic value of illnesses saved would be clear profit. In the case of the nondisease-bearing species, increase in real estate values which logically and inevitably follows the abatement of the nuisance may be counted on to cover the cost many times over. Any suburban real estate dealer in an infested region can expatiate eloquently and convincingly upon the devaluation in property attributable to the buzzing hordes. The wonder is that these practical business men have not long ago banded together in engineering and policing projects to rid themselves of this detriment to their interests, since science is ready to provide the simple means. Yet mosquito extermination, as a local and community measure, has been tried only in the last decade.

The pioneer organization was the Mosquito Extermination Association of New Jersey, divided into county units, which has done much toward cleaning up that tormented state. Long Island, another famous breeding spot, has its organizations also; and the idea has begun to spread widely through other states. One of the purposes of these antimosquito leagues is to secure legislation declaring the mosquito a nuisance in the legal as well as physical sense, and authorizing boards of health or other local authorities to proceed against owners of premises on which it breeds, so that the man who leaves in his back yard unprotected water barrels or tin cans, or unflushed sewer-traps in which the female flier may deposit her eggs, can be haled into court and penalized. New Orleans, which suffered probably the last Yellow Jack epidemic that any North American city will experience, since she so effectually marked the way of victory over the pest, applied the method of legal penalties, severely punishing house owners who neglected to protect with netting the universally used cisterns which supply the houses with water and the yellow fever bearing *Aedes,* or *Stegomyia,* as it was then called, with convenient hatcheries.

Long ago Howard enunciated the principle, apropos of the yellow fever and malaria carriers, that "every man is responsible for his own mosquitoes," since these species stick rather close to the immediate locality where they were bred. Salt-marsh varieties, however, have been known to be carried by gentle winds as far as forty miles. These involuntary migrations would directly complicate the scientific problem of defense, were it not for the fact that the transfer usually terminates in some spot where there are no marshes for the travelers to breed in, wherefore they either move back on reverse winds or soon die out. There are instances even of surprised and irritated communities, suffering under some such unprecedented invasion, having made elaborate campaign plans, only to have the besieging army vanish almost as suddenly as it appeared. A competent entomologist would have saved them the time, worry, and expense, by telling them to buy a few yards of mosquito netting and possess their souls in patience; for a salt marsh mosquito has no better chance of permanently settling inland than a mackerel has of building a nest in the Woolworth tower.

Pleasant and Unpleasant Conditions for the Mosquito

It is quite feasible, on the other hand, for a city or a localized neighborhood to make conditions so pleasant and convenient for *Anopheles* or *Culex* or other home-loving species, that they will take up their abodes and remain indefinitely. Last summer I spent a week in a New York City house in a block where the back yards were made into ornamental gardens. One of these, fashioned after the Italian pattern, with rock walks, ivied

Upturned bottles and tin cans are favorite resting places of the larvae of the mosquitoes that carry yellow fever. (Courtesy of Dutton.)

walls, and tiny flower beds, centered on a pool in which the artistic proprietress nurtured water plants, gold fish, and mosquitoes. The plants and the fish remained in the pool, but the mosquitoes sallied forth and devastated a neighborhood quite unaccustomed to them. Later in the season, a mild epidemic of "summer grip" visited the city, and that particular block was rather severely afflicted. I suggested to a resident physician who had many of the cases that there might be some connection between the artistic householder's aquatic hatchery and the high rate of sickness in the

block, in reply to which he explained with patronizing kindness that mosquitoes do not carry any of the influenza group of diseases. Quite evidently he was not impressed by my humble suggestion that an infliction which deprived a whole neighborhood of sleep might thus lower resistance to a point at which an infection would find especially favorable conditions for spreading, at least not impressed to the point of notifying the board of health. So, this coming summer, the ornamental pool will probably continue to raise and distribute its broods of minute poisoners, although a little oil on the water or a few surface minnows to keep the gold fish company and eat the mosquito larvae would effectually relieve the situation.

Northwestern Washington, the fashionable quarter of the city, suffered a visitation last summer, due to the dry season. In this quarter many of the houses are closed during the hot months, since the families go out of town. The plumbing was not in use, and there was not enough rain to flush the sewer traps; hence there gathered little accumulations of stagnant water upon which the egg-laden females of the species (a few of which always seem to persist even in localities apparently free from the pest) promptly descended. The result was a season of discomfort and expense for the unfortunate residents remaining, the only beneficiaries being the dry goods shops dealing in netting, and the drug stores carrying mosquito "dope." For an instance of the reverse, there is Baltimore, which, twenty years ago, was intolerable during the heated term because of the salt-marsh mosquitoes which swarmed over the city, and the home-bred species which found every convenience in the partly open drains and the back yard outhouses. Dr. W. H. Howell of the Johns Hopkins School of Hygiene and Public Health, himself a life-long resident of the city, writes me thus:

The bed of a water course made in concrete, like this one in Trinidad, the West Indies, prevents the formation of puddles and the breeding of mosquitoes. (Courtesy of Dutton.)

> There has certainly been a remarkable change in the prevalence of mosquitoes in Baltimore since we got rid of surface drainage and back yard privies by the establishment of a modern sewerage system. As an old inhabitant I can speak very decidedly and feelingly upon the subject. Formerly the early autumn, especially to those returning from a summer vacation, was a trying experience; now we have no occasion to think about it at all. In the old days when I was a lad, malaria was very common with us; now it is practically unknown. The general use of screening helped somewhat, no doubt, but the practical disappearance of mosquitoes of all kinds was coincident with the establishment of the sewerage system. Every one with whom I have talked, including the commissioner of health of the city, connects these two facts as cause and effect. It is a fact, however, that in 1913 or 1914 the mayor of the city had General Gorgas in consultation, and on his advice inaugurated a campaign through the city health department to clean up breeding places in and around the city. Some work of this kind is still continued by this department, but in nothing like so extensive a fashion as at the beginning. Nevertheless, our freedom from mosquitoes persists. When the loan was being urged for the construction of sewers, emphasis was laid, I remember, chiefly upon the greater cleanliness and a possible effect upon typhoid, the latter point being exaggerated, no doubt, but the chief beneficial return has been the elimination of the mosquito. In the outlying sections of the city, the annex, to which the sewage system has not yet been extended, they are still troubled with mosquitoes.

Newark has had a like problem for years, and has been able to maintain endurable conditions only by incessant watchfulness. A typical example was furnished when the salt marshes contiguous to an outlying portion of the city overflowed a sewer, covering about a hundred acres with sewage, and affording an ideal breeding place for the mosquitoes which presently appeared. The Essex County Mosquito Extermination Commission investigated, surveyed the tract, got a dredge, and drained the area. The mosquito died out. Any community could have done it. But most communities do not. New Jersey is both wise and militant on the mosquito issue. It has had to be.

Need of the Fighting Spirit

Some of the New Jersey fighting spirit would be valuable in California, where a formerly uninfested region of the beautiful Sacramento Valley has delivered itself over to malaria by special importation. Irrigation did it. It made fertile the dry soil of thousands of acres, which was what was expected of it, and brought in millions of *Anopheles* mosquitoes, which was unforeseen. Between fifteen and twenty thousand cases of malaria followed the irrigation

ditches. Economically considered, I am not prepared to say that the loss due to the mosquito-borne disease will cancel the agricultural gain from the water; but as the cases increase and the infested area spreads, it will certainly be a big item on the debit side of the ledger. Yet, a little precaution, a little supervision, a little effort directed to protective education would have prevented all this needless suffering and loss. Apparently the Irrigation Service does not keep an entomologist. It ought to.

A strange feature of this disaster—for it is nothing less—is the complacency with which those most concerned accept it. They appear to consider it an inevitable visitation of providence instead of an inexcusable combination of negligence on the government's part and inertia on their own. In an address before a scientific body, Frederick L. Hoffman, the statistician, drew a lively contrast between this indifference on the part of a whole region and the excitement and resentment of an English town, which, because of the reporting of one hundred and seventy-eight cases of malaria in a year (as against the Californian fifteen to twenty thousand!) held a special investigation, called in scientific experts, and took measures to see that the intolerable thing should not happen again. There had been no malaria in their town for a generation or more; they could see no reason why a case should have been allowed to creep in; they did not want it and they would not have it!

The creature nearest like the mosquito in unpleasant personal attributes is the bedbug. Socially considered, the bedbug is an outcast. It is hardly good form even to mention its name. Yet if we compare its habits and history with that of the mosquito in a broad and judicial spirit of scientific fairness, there seems to be no more reason for the pariahdom of the wingless bloodsucker than of the winged. The mosquito is just as poisonous and far more dangerous. It makes an irritating and sleep-destroying sound, whereas its rival preserves a decorous silence. In the matter of birth and breeding, the bedbug is distinctly superior to the mosquito, which frequently springs from the most malodorous and disgustful surroundings. Not that I am here making a plea for "the pestilence that walketh in darkness"; rather I am arguing that the whole evil regimen of mosquitoes should be tarred with the same brush, marked with the same social taboo. We should not execrate the one and tolerate the other, as we now do. The man who has once stayed at a hotel or traveled by a boat line, and has been bitten by a bedbug, is likely to eschew that hostelry and travel by some other route thereafter. Not only that: he is likely to utter denunciations and warnings for the benefit of his friends, and even to write wrathful letters to those whom he deems responsible for his sufferings. Broadening this spirit into the future, is it too much to hope that some day when civilization is a little more advanced and scientific knowledge a little more general, some such letter as the following from, say, the National Association of Artificial Peanut Shell Manufacturers, shall be received by the guilt-stricken chamber of commerce of Booster City?

Gentlemen:—We are in receipt of your kind invitation to hold our coming annual convention in your city, and in reply would say that we regret to inform you that several of our members having occasion to visit your locality in the past year report having been bitten by mosquitoes. Unless you can assure us that effective steps have been taken to rid the place of these unclean, unhealthful, and inexcusable parasites, you can hardly expect us to consider your proposition seriously.

Yours respectfully,

PTOLEMY Q. SMITH, Secy.

The mosquito is 100 per cent. a detriment. It is a public nuisance and a private torment. It is a danger to health, a depreciator of real estate, a drawback to industry, and an economic liability. Elimination of it is not only cheap, but actually profitable. In the light of modern scientific knowledge it is an anachronism. Why the mosquito?

REPORTING CASES OF TUBERCULOSIS

The President of the Board of Directors of the Municipal Tuberculosis Sanitarium of the City of Chicago has notified all physicians in Cook County that the Coroner "will not permit the Vital Statistics Bureau of the Health Department to issue burial permits for persons reported as having died of tuberculosis who had not been previously reported as having tuberculosis. The Cook County Coroner will make a thorough investigation of all such cases, in order to ascertain and establish the cause of death. Tuberculosis is a chronic, contagious, preventable disease, but it cannot be prevented if cases are hidden away in contact with young children until they are removed by death." This action certainly is justifiable.

Concerning Mosquito Control Measures

L. O. HOWARD

BOOKS could be written on this subject—in fact, books have been written about it—for it covers a large and complicated field. Most of the control work has been carried on for health reasons and has been directed against malarial mosquitoes and the yellow fever mosquito. In the United States, however, a great deal of control work has been started in regions where the disease-bearing mosquitoes are not abundant, and where the end to be gained has been simply relief from annoyance. But a good physician realizes that their abundance even with the mosquitoes that do not carry disease has a distinct effect on public health. Their presence intensifies the discomforts of patients suffering from any malady whatever, and the sleeplessness and physical annoyance which they cause lead to illness.

In this number, Dr. Howard continues his discussion of pestiferous and disease-bearing insects, giving detailed attention to mosquitoes.

Measures Vary with Localities

The subject is a complicated one, because mosquitoes vary so much in their habits and their breeding places, and measures looking to the control of the breeding must vary according to locality, to conditions, and to the particular kinds of mosquitoes which prevail. Control measures in a southern town must be different in a certain way from control measures in the country in the south, and these again vary with the kind of country. City measures in the north must also be different from country measures; and in the wooded, mountainous summer resorts in the northeast the problem again becomes entirely different; while in the northwest still other conditions prevail.

Measures Vary with Species

People write me and ask baldly what they can do to suppress the mosquitoes, and I always reply that I must know the species of mosquito that prevails before I can visualize their breeding places and make suggestions for control. Much money has been wasted in the draining or oiling of swamps, especially in the northwest, in which no mosquitoes breed. The old statement that where water stands mosquitoes breed does not hold for the whole country.

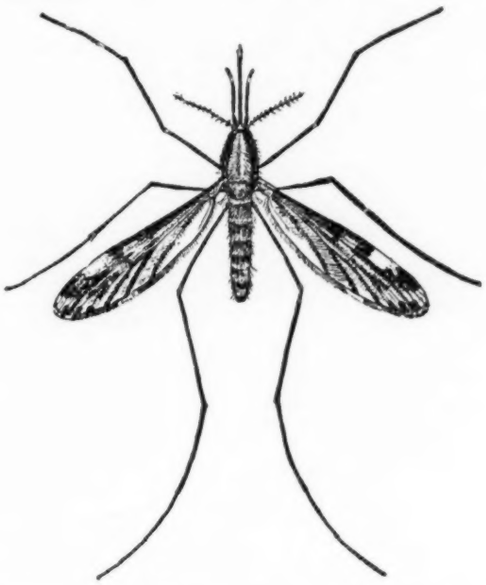
Wiping Out Malaria and Yellow Fever

Control measures against malarial mosquitoes have been going on in very many parts of the world for twenty years or more. The technic of malaria control is now fairly well understood by many people. In this country the United States Public Health Service has done magnificient work in this direction. The Great War, necessitating large concentration camps, brought about much public education in this respect. Fresh from his triumphant campaign at Panama, the late Surgeon General Gorgas having proved down there that mosquitoes can be controlled even in the tropics, was not insistent on the selection of especially healthy locations for these great concentration camps. As a result, many of them, for climatic reasons, were placed in the south, where mosquitoes — and malarial mosquitoes — abound. The camps were cared for by competent sanitarians, and the malarial incidence among the troops was very slight. Outside the camps for a three-mile radius the region was under the charge of the United states Public Health Service, and here too the operations were very successful, and, as just stated, of great educational value. Since the war the Public Health Service, in cooperation with many municipalities in the south, has carried out successful antimalaria measures, and these measures are now so well known that we need not go into them in this article. A recent book by W. E. Hardenburg, entitled "Mosquito Eradication," gives the necessary facts in detail, and bulletins published by the government and by different state boards of health are readily available.

No Excuse for Epidemic of Dengue

With the last outbreak of yellow fever in New Orleans in 1905, this dread disease vanished from the United States, and is now nearly nonexistent even in the tropics. With the practical abolishment of this disease, due to local control of the yellow fever mosquito, efforts to keep this particular mosquito in check have relaxed. With no yellow fever to carry, the yellow fever mosquito becomes simply a household annoyance. So far has this relaxing of effort extended that during the past summer there were in our southern states undoubtedly more than two hundred thousand cases of dengue, or breakbone fever, a painful and temporarily disabling disease with comparatively slight mortality, which is carried by the same species of mosquito.

Now, the yellow fever mosquito is distinctly a household species. It breeds only in accumulations of water in and about houses, and can be controlled with comparative ease. The wonderful work done by the Public Health Service under Dr. J. H. White in New Orleans



Anopheles punctipennis. The mosquitoes of this genus carry from person to person, as they suck the blood, the parasite which causes malaria.

during the yellow fever outbreak of 1905 showed this plainly, and undoubtedly more than four thousand lives were saved in this way during the summer of that year. Then too, the work of the International Health Board in its more recent campaigns in Ecuador has shown the same. It means simply the abolishing or care of standing water about dwellings. Necessary water tanks or barrels are screened or stocked with fish. Mr. LePrince, now of the Public Health Service, has recently stated that in his opinion all health officers or boards should keep breeding stocks of *Gambusia affinis* (a top-minnow) for distribution and use in this way.

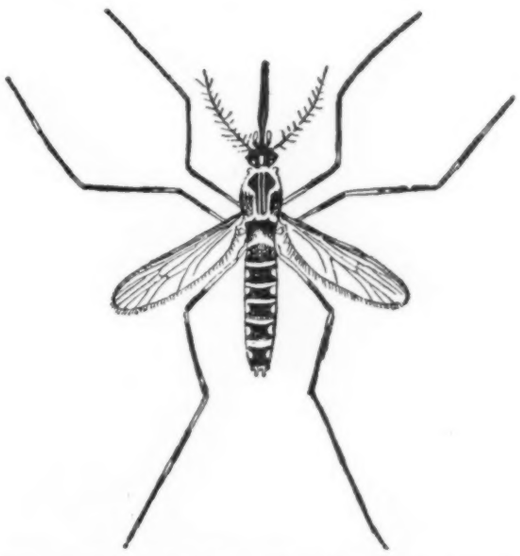
Last summer's outbreak of dengue was wholly unnecessary and was the result of general ignorance and indifference. But it was such a severe lesson that on the whole it will have done good. It seems that there was apparently at least one striking exception among the southern towns last summer. In Miami, Florida, about five hundred cases of dengue were reported during the summer of 1921. This excited the health authorities and during the summer of 1922 antimosquito measures were adopted, and the disease was practically eliminated. It is altogether likely that other southern towns will do the same the coming summer.

This is all that need be said in this article about those mosquitoes that have down to the present time been shown to carry disease; but it is about the control of the other species that the situation becomes more difficult and much more diverse in its character.

Depriving the Rain-Water Barrel Mosquito of a Home

Over the greater part of the United States at moderate elevations, in villages and towns, the common rain-water barrel mosquito, *Culex 5-fasciatus,* is the most annoying form. It has several generations each summer and breeds in all small accumulations of water, in tanks, barrels, cesspools, sewer-traps, unused water-closets, clogged roof-gutters, discarded cans and bottles and the like, as well as in pools in swampy land and along the margins of badly kept ditches. With this species the oiling of swamp pools or the drainage of the land, the clearing of the margins of ditches, the oiling of sewer-traps and cesspools, the cleaning and repair of roof-gutters, and the destruction of cans and bottles, with constant care and watchfulness, will bring relief.

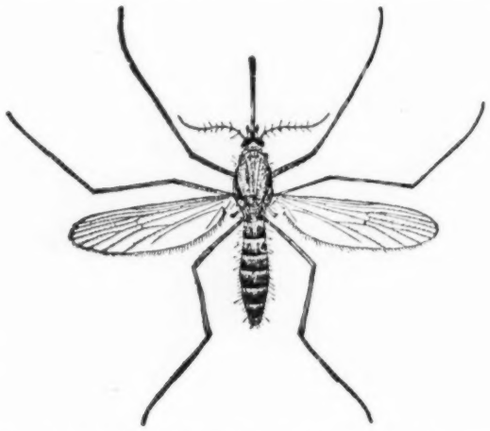
A curious condition of affairs exists in a number of cities, running, say, from Washington and Baltimore west to St. Louis and even possibly to Kansas City, in regard to sewer-traps. Even further north, in cities, the oiling of the sewer-traps at street corners is advisable and is in many instances carried out; but the private sewer-traps at the back of houses in fenced-in small yards in cities where many of the houses of the well-to-do are closed during the summer offer an interesting problem. With



Aedes aegypti, female. Of all mosquitoes, this is the most dangerous in the United States, for it carries yellow fever probably in the same manner that the Anopheles carries malaria.

frequent summer rains these sewer-traps are naturally flushed so frequently that the eggs and larvae of mosquitoes are carried away down into the main sewer and give out no adults for that neighborhood. But if there comes a dry

summer when there is little or no rain, these back-yard sewer-traps become prolific breeding places for mosquitoes where the house is closed



Culex 5-fasciatus, female, known as the common "house mosquito," because it is chiefly responsible for annoyance about houses, especially in the north.

and the occupants have gone north or to the seashore. Take my own case last summer: I oiled my own sewer-trap, but my next-door neighbor was away with his family and I could not climb his fence and oil his sewer-trap, on account of the danger of being arrested. The result was that his mosquitoes flew into my bedroom window. Last summer was an exceptionally dry summer, yet my druggist tells me that he sold more mosquito lotions in two months than he had in a dozen years before.

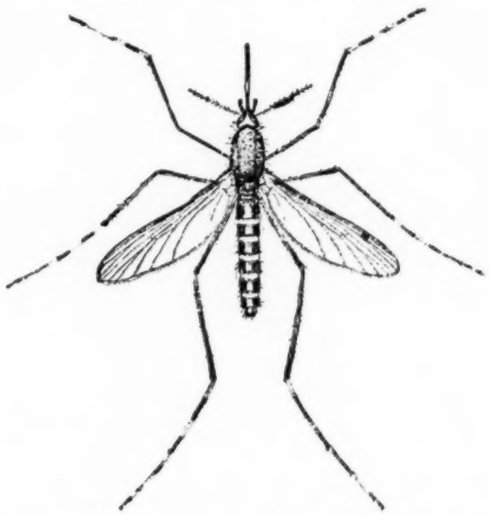
Too Much Money Spent for Window Screens

But after all we are spending altogether too much money in towns and cities for window screens. If the measures against the house fly, pointed out in my article in the last number of this magazine, are carried out systematically and the proper antimosquito measures are undertaken in villages, towns, and cities in the midregion of the country, window screens will be nearly unnecessary. I estimated some years ago that the people of the United States were spending ten million dollars a year for window sceens. Mr. LePrince, who evidently has inside information from the manufacturers, stated at a recent meeting of the New Jersey Mosquito Extermination Association that thirty million dollars worth of screen wire in the roll is sold each year, and of course the cost of the wire is only one element of the expense of screening.

A heap of odd receptacles, collected from yards, excellent breeding places for the "household" mosquito. (Courtesy of Dutton.)

New Jersey Moves Against the Seashore Mosquito

The seashore mosquitoes for the most part require a very different treatment. And this phase of mosquito control has been studied and handled by the State of New Jersey in an extraordinarily efficient way. The prevalent mosquito of the Atlantic coast is known as *Aedes sollicitans* and it breeds in brackish marshes. It has but one generation annually, but it flies for extraordinary distances. It has been shown to travel forty miles inland from the Jersey coast, and in great abundance. The state of New Jersey has legislated in such a way that the seacoast counties have been able to get state help to match funds which they themselves put up, and as the result the



Aedes solicitans, female, the salt-marsh mosquito.

marshes from Hoboken on the north to Atlantic City on the south, and even farther, have been diked or ditched, or both, at a comparatively slight expense and to such an extent that the mosquito scourge has been relieved enormously. This effort, which has been under way for comparatively few years, has already resulted in the reclamation of great areas of marsh land for agricultural and manufacturing purposes; cities and towns have grown, and new ones have been started; the taxable value of a great extent of land has been so increased by these measures as to make the money expended by the state seem insignificant.

People living along the seacoast from Florida to northern Massachusetts who suffer from mosquitoes from the brackish marshes should inform themselves concerning the New Jersey work and should start movements to duplicate it in their regions. Dr. T. J. Headlee, of Rutgers

College, New Brunswick, New Jersey, is the secretary of the New Jersey society and the state official having general charge of these measures. He is a most efficient and competent man and his advice should be asked in such cases.

The Mosquitoes of Woods and Hills

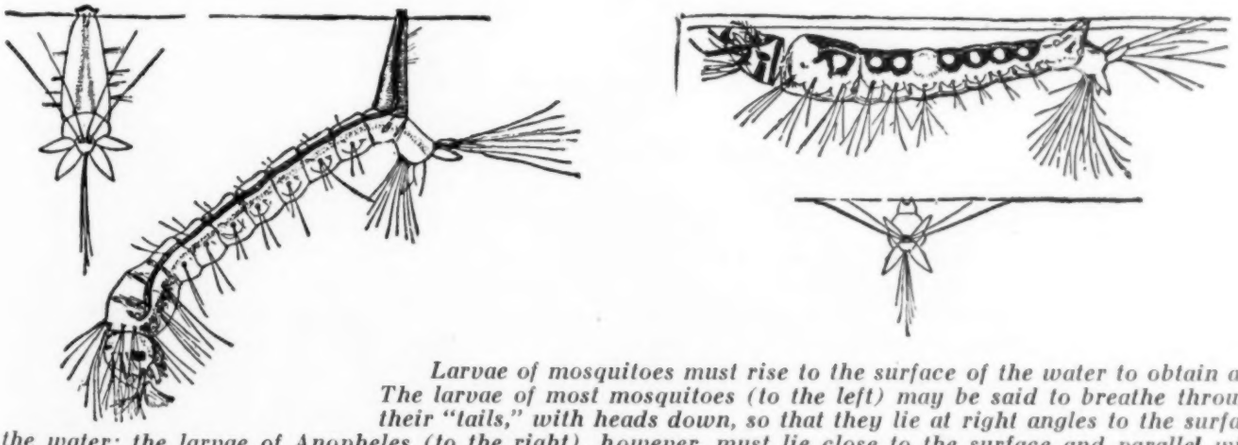
And now a few words about the mosquitoes of the New England woods, the Adirondacks, and the Catskills, and northern forms extending clear to the state of Washington. These mosquitoes practically all belong to the genus *Aedes* and have a single generation annually. Their eggs are not laid in water as with most of the other mosquitoes, but they are placed by the females in midsummer in hollows in the ground that will be filled by snow water in the early spring. When the snow melts and the hot spring sun penetrates through the woods to the surface of these pools the eggs hatch and the larvae swarm and rapidly develop and the adults come out practically before the summer begins. These adults persist through May, June, July, and sometimes August, mating at some time or other during their long adult life and laying their eggs, as just stated, in hollows on the ground. The control of these species is therefore very difficult.

Eysell, in north Germany, advocates the burning over of the fallen leaves in the autumn in such hollows where pools will be formed the following spring, but this process would be dangerous in a forested region where autumn fires are to be avoided. At a summer resort in the Catskill Mountains, I have tried to make a thorough scouting of the snow-water pools during April, and found the larvae to be present in great numbers. I had these pools oiled, and the result was satisfactory only to a degree. These woodland pools, in addition to being fugitive, are very numerous, especially in a rocky country, and are often very hard to find; and the maturing of the mosquito larvae is very rapid. Such oiling over a large area in

Drainage of such a stretch of swamp in some portions of the country would be of benefit not only to the pocketbook of the owner because of the increased value, but also to the health of his family and neighbors, for certain kinds of mosquitoes might thereby lose their breeding place.

the course of two weeks is practically impossible. Very many little hidden pools will be overlooked, and thus many mosquitoes will escape to last on into the summer. And then there is another thing to be considered: although, with the exception of the salt-marsh forms, mosquitoes as a rule do not fly very far, these northern mosquitoes are on the wing for at least three months and cannot fail to be wafted by the gentler winds to long distances from their places of birth; so that if this careful spring oiling is done with great pains and considerable expense over a restricted area—say, a large summer colony on the mountain sides, such as Twilight Park or the Onteora Club in the Catskill Mountains—it is practically certain that adult mosquitoes will waft in during June and July from regions where no treatment has been attempted. Still the spring effort is worth while and is the only thing that we can suggest at present beyond the more permanent filling-in of all hollows.

On the northwestern plains extending into British Columbia and the other Canadian provinces, the mosquitoes are practically all



Larvae of mosquitoes must rise to the surface of the water to obtain air. The larvae of most mosquitoes (to the left) may be said to breathe through their "tails," with heads down, so that they lie at right angles to the surface of the water; the larvae of Anopheles (to the right), however, must lie close to the surface and parallel with it. This peculiarity gives important information to persons who are trying to exterminate the malaria-bearing mosquito.

of this type. They breed in irrigated regions, laying their eggs on the sides of the ditches, where they hatch when the irrigating water reaches them. They also hatch on the occasion of the spring overflows of some of the big rivers, such as the Fraser River in British Columbia. Mr. Erich Hearle has found that twenty-eight thousand acres of temporary flood-water breeding areas exist up there, and that from these occasionally issue vast numbers of *Aedes aldrichi* and *A. vexans.* But here and there in this northwestern country there are swampy areas which an easterner or a southerner would at once accuse of mosquito possibilities, but which are entirely innocent. In some cases much money has been spent in oiling these places, wholly unnecessarily. The characteristic breeding places of the different species of *Aedes* even vary, and before an intelligent survey of possible breeding places can be made to the best advantage it is necessary that the species of mosquito be identified by some expert.

Where to Send for Information

This article, therefore, comes practicaliy down to the following. If you wish to know about salt marsh mosquitoes, consult Dr. Headlee of New Jersey. If you wish to know about yellow fever or malarial mosquitoes, consult your own state board of health, the United States Public Health Service, or the Bureau of Entomology of the Department of Agriculture at Washington, and the same advice is given regarding the ordinary rain-water barrel and transient pool mosquitoes of the average town or village which is not situated near large forested areas. In the case of woods mosquitoes or northern mosquitoes or those on comparatively high elevations, by all means find out the names of the prevalent species by consulting some competent entomologist (send them to me at Washington, if you wish); and upon such identification will depend the control means to be adopted. The Bureau of Entomology at Washington publishes a little bulletin giving most of the facts and also the best remedies.

It may be added that to relieve the poison of mosquito bites nothing is better than rubbing on moist toilet soap; while to secure a fair night's sleep in the presence of mosquitoes the best mixture I have found is oil of citronella, two parts, spirits of camphor, two parts, oil of cedar, one part. Sometimes a few drops of this mixture on a bath towel hung at the head of the bed will answer; again it may be necessary to rub it over one's face and hands.

People Who Do Not Like Sugar

Vilhjalmur Stefansson

IT is commonly assumed that everybody likes sugar. As a matter of fact, the taste for sugar is acquired. There are probably several hundred whalers still living in the United States and two or three missionaries who came to the north coast of North America so early that they know sugar to have been distasteful to every person living along a thousand miles of coast-line. When Eskimos are introduced to the prepared foods of civilized communities, the ones they first accept are the "tasteless" kind, such as pilot bread, rice, or flour soup, unsalted and unsweetened. Next come foods with a "clean" taste, such as tea without milk or sugar. The foods they most dislike—at first—are those with a strong taste of salt, such as canned corn beef, and next after saltiness they dislike sweetness.

VILHJALMUR STEFANSSON has made some observations in "the friendly arctic" that are of interest for more reasons than the study of ethnology and geography.

I should not be afraid to bet a hundred to one that any Eskimo above the age of six would spit out candy, syrup or honey, or anything pronouncedly sweet, the first time he is given the opportunity to taste it. The Coronation Gulf Eskimos, for example, are a very courteous people and consider it bad manners to make a face or comment on food that they do not like when there are visitors. I have seen them swallow with an effort faintly salted foods, or merely take a sip of tea or coffee that had some sugar in it, and they almost involuntarily put out of their mouths anything very salty or pronouncedly sweet.

Sugar, then, is disliked by Eskimos until they get used to it. Curiously, enough, they get used to salt more quickly than they do to sugar.

The Diseases Caused by Parasites and Their Geographic Distribution

C. S. BUTLER

WHAT is the cause? That is the first question a modern physician would have asked himself could he have examined Simon's wife's mother when she lay sick of a fever. The modern Aesculapius, noting the rise of temperature and knowing that malaria flourishes on the shores of the Sea of Galilee would have reasoned that the patient may have been suffering from this common complaint. He would have had an examination made of the blood, among other procedures, in order to learn if the cause really were malaria, or if it were malaria complicated by something else, and only after he had determined the cause or causes as accurately as he might, would he have begun treatment. Had the attending physician found that the blood of Simon's wife's mother harbored malaria parasites, he would have prescribed quinine with every assurance that the patient would have made an uneventful recovery. Quinine is science's rebuke to fevers of malarial origin.

C. S. BUTLER, M.D., is a commander in the Medical Corps of the United States Navy. Dr. Butler tells of the place of protozoa and bacteria in the universe, a source of blessing as well as of calamity to man, and why some parasites must be fastidious in attaching themselves to man in only certain countries and localities.

Granted that the diagnosis in the case of Simon's wife's mother was malaria, it was only after sixteen hundred and forty years that the means of curing her complaint came to be discovered, and not until after eighteen hundred and eighty years that the cause of it was laid bare. It took approximately nineteen hundred years to discover how the organism that causes this disease is transferred from man to man. At present, with a knowledge of the cause of malaria and of how it is transferred, it is possible to interfere so seriously with the life processes of the parasite as to make feasible the blotting out of malaria as a cause of death. While awaiting this welcome day, physicians are able to save millions of lives by the use of quinine. Some diseases which formerly killed human beings in large numbers are now of historical interest only, while of others we may confidently say that their end is in sight.

Principal Causes of Death of Man

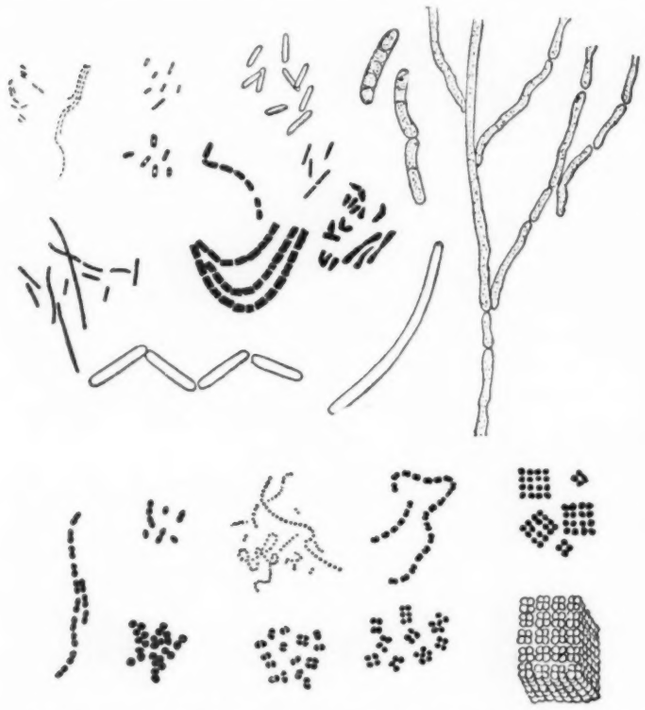
The statistician, in his attempt to classify the many causes of death, must list a thousand or more technical names which physicians use in their attempt uniformly to describe the causes of death. Thus the Manual of the International List of Causes of Death gives one hundred and eighty-nine titles under which are arranged several thousand fairly exact names for diseases and conditions which may result in death. These may be classified roughly as (1) senility (old age), (2) dietary deficiencies, starvation and vitamin deficiency, (3) accidents, (4) changes due to disease and disturbance of the functions of organs, (5) tumors, (6) poisons from outside or formed within the body, (7) mental diseases, and (8) infective diseases. To the infective diseases the peculiarities in geographical distribution are largely due.

If we could picture a world without infective disease of various types to carry us off, mortality lists would be remarkably simplified, man would live on indefinitely, and perhaps more frequent wars and even cannibalism would be resorted to in order to provide food for that upper limit which the earth could support, thus distorting the whole plan of the universe. It may serve to orient us better if, before speaking of infective diseases, a little be said about senility, for this, like most of the causes of death just enumerated, is in universal operation. Senility may be defined as the simple wearing out of the living machine. Now the best of modern figures for life expectancy is a little more than sixty years. Only one or two counties in England, and one or two of our states can show such good averages.

The Length of Life Before the Christian Era

The oldest living thing in the world at present is a giant Sequoia tree which stands in the Sequoia National Park in California. The tree is estimated to be about four thousand years old, having been a patriarch of two thousand years at the beginning of the Christian era. Considering the diseases which may destroy plants and the accidents which may befall them, this is a remarkable instance of the operation of the law of chance.

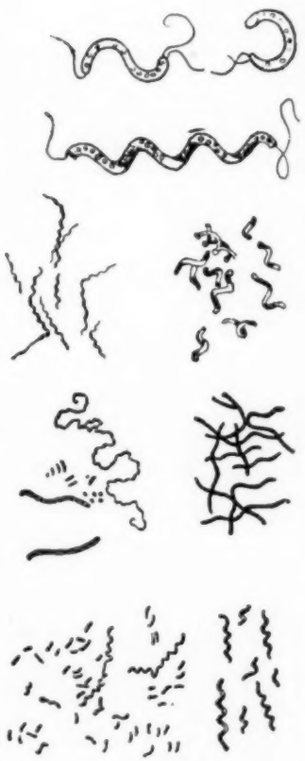
We are told with regard to the age of the higher animals that Adam lived for nine hundred and thirty years before he was gathered in, that Enoch, who died as a mere youth, lived only three hundred and sixty-five years,



Appearance and arrangement of some of the rod-shaped and round parasites. These are vegetable forms; the branching one is a mold. All are magnified several hundred times.

while his long-lived son, Methuselah, made a record for "downright living" by not stopping until he was nine hundred and sixty-nine years of age. The performance of Noah was even more remarkable, for he didn't start to rear a family until he was five hundred years old, and he was six hundred when he piloted the ark through uncharted seas and landed her safely on Mount Ararat. Not content with these accomplishments, about the time he was seven hundred years old, having underestimated the voltage of some home-brew, he became dangerously intoxicated and while suffering from the after-effects of this spree was led to do an unjust act in the case of Canaan, his grandson, by committing that unfortunate to eternal servitude. Ham, Canaan's father, had made the mistake of telling his brothers to cover up the parent's besotted nakedness, and as events proved, Noah penalized the "innocent bystander," Canaan, whose only sin was that he was the son of his father. Since Noah was a just man, as the record states, it is evident that alcohol had destroyed his capacity to think, for not only did he fail to punish Shem and Japheth, who were equally guilty, if guilt there was, but was doubly unjust in permitting these two to profit by Canaan's punishment. In spite of alcoholism Noah lived to be nine hundred and fifty years old. The record does not state whether the cause of death was alcoholism or not, but this age-record is so out of proportion to what obtains in modern times, even with those who take alcohol moderately, that we are forced to the belief that the fault is with the ancient system of reckoning time, and that the men of 3000 B. C. were no longer-lived than we are.

If three thousand years before the birth of Christ there were no parasites such as bacteria, fungi, protozoa or multicellular animal pests to rob us of life, however, why shouldn't man have lived on for centuries? Carrel and his associates have shown that the cells of a chick's heart kept free of infection multiply indefinitely, that the cell is potentially immortal. Ebeling makes the statement, based on the mathematics of Carrel's ten-year old culture, that if ideal conditions of growth could have been effected this culture could have produced in the time it has been running a mass of tissue as big as the sun. Obviously, in the creation of the universe such a monopolistic tendency as this had to be curbed, and it was for this reason that divine providence, very early in the plan of things, produced parasites to kill us off, and saprophytes and other forms of animal and vegetable life to change organic material back to its elements, thus utilizing over and over again the energy of the universe.



Bacteria and protozoa. Some are shaped like the organism of yellow fever, others like that of cholera.

The Antiquity of Infective Organisms

These biblical incidents were cited not in any spirit of flippancy, but in order to bring out several points. First, we have in the incident of Noah an early record of direct evidence of the existence of unicellular organisms in action; second, the evidence that the product of the growth of those organisms was a toxic substance which we know as alcohol; third, that the immediate toxic effect of this product of the yeast plant was similar five thousand years ago to what it now is, and, fourth, that the later effect of this drug, that is, its destruction of the power of the mind to reason has remained constant throughout the ages.

The action of the yeast plant, a microscopic organism which technically is called *Saccharomyces cerevisiae,* produces the poison alcohol when it grows on starches and sugars; this action is exactly paralleled by many other organisms in their production of poisons which cause disease when they grow inside the body.

One of the many types of molds; this one has fruiting bodies.

We may offer evidence for the antiquity of infective processes in another way. To do this, it will be necessary to define certain terms. A parasite, in the biologic sense, is an animal or vegetable organism which grows in or on another animal or plant, which is ordinarily called the host. Both animal and vegetable parasites have, as the unit of their growth, a single microscopic body called the cell. Single-celled vegetable parasites are usually spoken of as bacteria, while vegetable organisms composed of branching or more complicated units are called fungi, or molds. Neither of these types of plant organisms is possessed of chlorophyl, the green substance which in higher plants absorbs atmospheric carbon as food. Their parasitic tendencies are partly explained by their necessity to get this element from organic substances, plants or animals, which have obtained their carbon either from atmospheric carbon dioxide, as within the higher plants, or from animal sources.

Ectoparasites and Endoparasites

Animal parasites may be single-celled, the protozoa, or multiple-celled, such as tapeworms, roundworms, fleas, and lice. Some of these higher forms live on the outside of the body of the host, because of which they are called ectoparasites. Fleas, ticks, and lice are examples of this class. Others of the higher forms, such as intestinal worms, are sometimes referred to as endoparasites, because they live in the internal parts of their host.

When parasitic organisms, whether one-celled or many-celled, grow in or on a host and disturb the vital processes of that host the condition is spoken of as an infection. In case of ectoparasites, the condition is often referred to as infestation.

In each of the four divisions of parasites just mentioned, there are numerous organisms which have become so dependent on man for the proper carrying out of their life processes that these are seriously interfered with if they are transferred to some other animal. In many cases, this interference is so marked that the parasites die, thus showing that they are unable to live on any except the one type of host. Such parasites are said to be obligate to the particular species of host. If the parasite is peculiar to man, it is spoken of as an obligate human parasite. All higher animals and plants have their peculiar parasites and their special diseases. On the other hand, some parasites will grow on several hosts.

Typhoid fever, leprosy, and cholera are diseases caused by bacteria, which under the conditions that obtain in nature are peculiar to man. Protozoa of syphilis, of yellow fever, and of malaria are so fond of man that they will not even consider infecting any other host. *Homo sapiens* also has the monopoly on one flea and at least three species of lice. He can boast of two tapeworms which reserve their mature affections for him only; during the tender period of the worms' youth, man shares the affections of one of these worms with the hog, and those of the other with the ox. Parasitically speaking, man and the pig are on very friendly terms, and this particular tapeworm is "their very own."

When it comes to blood infections with worms, the monopolistic tendencies of man are well taken care of. He has two species of roundworms called filariae which he will not share with any other host. In the case of one he farms out the business of transfer to his fellow man to a certain biting fly, and in the case of the other the worm accepts the good offices of several species of mosquito which, at the risk of disease and perhaps death to themselves, undertake to nurture and develop the parasite to a certain extent in order to give the young animal a good start when implanted in the circulation of the next human victim.

Saccharomyces cerevisiae; in simpler terms, brewers' yeast.

Flukes and Schistosomiases

For a really meteoric life-career, however, some of the parasites called flukes are most remarkable. Flukes are like tapeworms in some respects. Usually, they are hermaphroditic, that is, they have the organs of reproduction of both sexes, but there are three species of human blood flukes in which the sexes are separate. The warm-blooded host of these parasites is man, and the adult worms

(the female folded in the conjugal embrace of her mate) live in the veins of the bladder or intestine of man. The eggs deposited in the veins of these organs are able, because of their peculiar shape, to wander through the walls and to enter eventually the bladder or bowel. Thus they gain exit to the outside world. Many of these ova are fortunate enough to gain access to water and when this happens the eggs hatch, and the motile little animal which is thus set free finds the fresh water snails of certain countries suitable intermediate hosts. The embryo enters the tissues of the suitable mollusk and there sets up a nursery called a sporocyst. This sporocyst eventually begins to give out to the water in which the snail lives myriads of further developed parasites called cercariae. These, which are also of microscopic size, are, if the opportunity presents, capable of penetrating the skin of man. They then are taken up by the blood stream of the human host and carried to the liver. Here they undergo further development and are differentiated into males and females. When this is accomplished, they wander down into the aforementioned veins of the bladder and bowel to start their family in the new environment. The adults are hair-like worms about one inch in length and are called schistosomes. The complaints which they cause are spoken of as schistosomiases and have been prevalent throughout all Africa and eastern Asia for thousands of years. Knowledge of the life history of these parasites has only been completed during the present century.

Schistosomes are quite fastidious as regards the snail, which they permit to develop their intermediate stages, the sporocyst and cercariae. The species of mollusk must be the correct one. The disease they cause, schistosomiasis, will not be implanted in places and countries free from this particular snail. In other words, the spread of the disease is governed by the geographic distribution of the particular mollusk. North America has been spared this disease of the Pharaohs simply because it hasn't the snail. The West Indies and South America, having suitable snail intermediaries, have developed at least one type of endemic schistosomiasis. Doubtless the disease was imported from Africa by negro slaves.

Obligacy of Animal and Vegetable Parasites

There are numerous similar instances of the failure of diseases of man and animals to flourish after introduction into a country which has no suitable intermediary. This principle of intermediation by arthropods and mollusks for the diseases of warm-blooded animals is one of the great discoveries of parasitology during the last fifty years. The machinery of sanitation, quarantine, and prophylaxis, not only of medicine and of animal industry, but also of plant industry makes constant use of this all-important principle.

I have tried to point out that in diseases caused by bacteria, by protozoa, and by the higher animal parasites, there are numerous instances in which the living cause of the particular disease, the virus, clings only to man. There are finally certain parasitic fungi, or molds, obligate to man. Obligacy in this sense is a remarkable fact. Why is it that a parasite will take such notice of the slight differences of body reactions in man and in the higher apes that it will grow in one and will refuse to grow in the other. The only answer is that the species of parasite has lived with the particular host for so long that it demands those cellular conditions which obtain in that host.

A distinguished zoologist, in order to point out the truth of the principle of evolution, has called attention to the fact that if father Adam had been compelled to transmit to posterity all those diseases and parasites which are peculiar to man, he would have had such a pathologic burden on his shoulders that he could never have struggled through with the nine hundred and thirty years with which he is credited. Furthermore, he would have had to carry over, among others, three diseases which are, in modern times, considered a disgrace as well as a misfortune.

Human Life Dependent on Bacteria

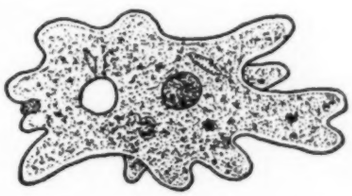
There are three reasons why the vegetable kingdom antedated all other regal lines of living things on the earth. These are (1) the atmosphere, (2) the carbohydrate molecule, and (3) the vitamin. Without bacteria, animal life would not have air to breathe, food to eat, nor the spark of life which enables it to utilize the first two for growth and development.

The lowest forms of vegetable life are usually thought of only in connection with the production of disease. Few of us stop to think that all higher life actually depends on bacteria and all forms of higher vegetable life are but evolutionary products of these lowliest forms. Bacteria are responsible for tearing down dead organic material and reducing it to its elements. In doing this, nitrogen is furnished to the atmosphere to dilute the oxygen, which is, in part, furnished by higher plant life. The green leaves of higher vegetable life rob the air of its carbon dioxide and combine the carbon with other elements to make starches and sugars and fats and proteins on which animal life depends. Furthermore, it is in the lowly vegetable cells that the indefinable substances called vitamins find their origin. These substances, like the spark plug in the gas engine, furnish the

initial energy which fires the fuel of our food and makes cellular growth and regeneration possible.

The interrelation of bacteria and the chemical reactions which take place in nature is coming to be better understood, and the wide gap which separates the inorganic world from the organic—the inanimate from the animate—is gradually being filled in. It has been recently shown that substances hitherto obtainable only from living organisms or in the laboratory at temperatures incompatible with life may be made from inorganic substances found abundantly in nature and at the ordinary temperatures of life. Abundant quantities of sugar, for instance, may be made by subjecting colloidal solutions of iron oxide to carbon dioxide in the sunlight. Many years ago, it was shown that unfertilized sea urchin eggs can be hatched by purely physicochemical methods. These observations encourage the hope that eventually chemistry may furnish the explanation of the origin of organic life.

It will be clear from what has been said and from the definition of a parasite, that the king of all parasites is man himself. Millions of years after father Bacterium and his vegetable descendants had been managing this gigantic chemical plant on which we live and which we call the earth, and after they had the atmosphere, the food supply, and the vitamins at work, a creature came into being which was slightly different, but desirous of sharing the food and utilizing the air which were on hand. This interloper was also greedy for vitamins which were present in growing plants. We now speak of this creature as an ameba, a protozoon, or first animal. Man is one of his descendants, as are all other animals. The animal kingdom is therefore parasitic upon the vegetable kingdom, and as man utilizes both for purposes of food, he is by that fact the chief parasite.



An ameba, the ancestor of man in the cold gray dawn of the world.

Acquisition of Parasitic Infections

Parasitic infections are acquired in one of the following ways:

1. By contact, as in syphilis and leprosy, and many of the diseases of the skin due to molds.

2. By swallowing the parasite, as in dysentery, cholera, typhoid fever, and ascariasis.

3. By breathing in the living material carried on droplets or dust, as probably occurs in influenza, pneumonic plague, measles, and many other diseases.

4. By direct inoculation, as in cases of lockjaw or the infections which result from war wounds.

5. By indirect inoculation, as in hookworm disease (after the egg of the parasite has developed into a larva in the soil) or as in bubonic plague, after the bacillus has been taken up by the flea.

6. By metaxeny, the complicated process in which mosquitoes, ticks, mollusks, lice, bedbugs, or other cold-blooded intermediaries are essential to the parasite before the infection can be passed along to new hosts.

Some of these methods of acquiring infective disease are simple, others fairly complex, and still others weirdly complicated. To acquire syphilis, all that is necessary is to get some of the syphilitic virus, the microscopic organism, into an abrasion, perhaps too small to be seen, and if the unfortunate person has not already suffered from this disease, the seed will probably have fallen on good ground. The peoples who excel in the use of soap and water are freest from diseases conveyed by contact.

To acquire cholera or typhoid fever, all that is usually necessary is to swallow material containing the vibrio of cholera or the bacillus of typhoid. Water, food, and "carriers" figure in the transfer of this class of diseases.

Diseases which are acquired by breathing in the virus as it floats passenger-like on droplets or dust particles are the most difficult to control, from the sanitarian's standpoint. Influenza, for example, in epidemic form, seems to overcome the ordinary methods used to prevent spread. Contagious colds are somewhat similar; measles is another highly infectious representative of this class. It should be added that the "striking distance" to which these viruses can be carried is limited probably to a few feet.

To the bacterial diseases acquired by direct inoculation belong many of those which, before the days of Pasteur and Lister, made the surgical and maternity wards of hospitals places to be shunned rather than sought. Much of the history of bacteriology is connected with surgical infections by organisms such as those which produce boils, erysipelas, septicemia, hospital gangrene, childbed fever, and lockjaw.

Diseases acquired by indirect inoculation may be bacterial, protozoal, or helminthic (worm) infections. The outstanding example is the rodent disease plague. Here the flea siphons the plague bacillus from the circulation of the rat, the bacillus multiplies in the stomach of the flea, and if the flea, as often happens, deserts the rat after its death and takes to man, it may contaminate the region of the wound made in feeding on man and thus give the opportunity for conveying this deadly disease to the human being. Plague

is ordinarily a rodent disease. A slightly different form of indirect inoculation occurs in hookworm disease. The eggs of the worm deposited in the intestine of man develop when passed out into the air into a worm of microscopic size; the worm, after a period of growth, is able to crawl through the intact skin of human beings and eventually to find its way back to the small intestine, where, as the adult, it attaches itself to the inner membrane of the gut, and lives for long periods at the expense of the human host. Next to malaria, hookworm disease is probably the most important of all human diseases caused by animal parasites.

In this connection it might be well to mention that many of the larval forms of the animal parasites of man and animals have a disagreeable way of migrating by means of the blood stream or through the tissues or by both methods. Thus in ascariasis, infestation by the roundworm, although the embryo-containing egg is swallowed, the embryo migrates by means of the blood for a considerable time before it comes to rest in the small intestine.

The last method, metaxeny, by which man may acquire parasites, and this method seems to be reserved for animal parasites, is by all odds the most picturesque. It requires the teamwork of two animal species. Malaria, filariasis and schistosomiasis, and probably yellow fever, are examples of metaxeny as far as man is concerned. The principle may be illustrated by malaria, which is a common and deadly disease of all warm and of most temperate lands. Wherever mosquitoes luxuriate, malaria is possible. A man infected with one of the species of malaria parasites may overcome his infection and recover or the parasite may overcome him and he dies. If provision were not made for the parasite to get from one man to another it would make no difference to the parasite which of these results occurred, since it would be finished in either case. But since nature is impartial to her children, she wishes both the parasite and the host to come to an understanding in order that both may live. So the parasite takes advantage of the food-getting habits of certain species of mosquito and transfers to the mosquito when it sucks man's blood. After a period of sexual life in the body of the mosquito, the malarial parasite rears a brood of young which accept transportation to the circulation of a second man at the hands of the identical insect which had siphoned its forebears from the circulation of the first man. On arrival in the new host the young forms start a different sort of life from that lived within the mosquito. They multiply in the red corpuscles of man's blood and destroy these faster usually than the infected person can manufacture them, thus making the victim sick and often killing him.

It took the best brains in the world to put together the links of this chain of knowledge, the chain that ultimately will shackle the purveyors of disease.

Destruction of Intermediary Hosts of Diseases

Many diseases of man and animals are propagated in the way just described. If an infection is absolutely dependent on a particular species of insect for its propagation the disease may be driven out, if the particular go-between can be destroyed. Thus, one of the aims of quarantine is to keep a country not alone free from the introduction of the particular disease in man or animals, but also to prevent the implantation of the essential intermediary host. The destruction of the intermediary host is the main consideration in this type of diseases. The deadly African fly-borne protozoal disease sleeping sickness was never able to gain a footing in America, though often introduced during slave days, because the suitable species of fly transmitter is limited to Africa in its geographic distribution.

From this brief résumé of the causes of disease, it appears that by far the majority of diseases and deaths among human beings are connected with parasitism, that parasites of animal or vegetable nature produce disease and death by utilizing the tissues of the human being for food, and that in doing this, or in order to make the food available, they often produce substances which poison the host.

Geographic Attractions for Parasites

For the proper growth of all living things, to which parasites belong, warmth, moisture, and a usable food supply are essential. If we consider the earth an incubator and recall that the best conditions for an incubator are the three just mentioned, we will begin to understand why that portion of the earth which we call the tropics offers on the whole better conditions for all types of life than do the colder regions.

Geographically, when we speak of the tropics, we mean that band of the earth's surface approximately three thousand three hundred miles broad (47 degrees of latitude) included between the tropics of Capricorn and Cancer. This band of earth and water, about seventy-nine million square miles in

area, includes all types of climate from the hottest to the coldest and from the dryest to the most humid. Thus in a study of the map of South America, we find that the isotherm of 60 degrees Fahrenheit (mean temperature) runs north along the Cordillera from the fortieth parallel of south latitude right to the equator, so that the inhabitants of the high Andes, although right under the equator at the north point of the curve, have temperature conditions similar to those along the Canadian border in North America. In this area, it is possible in traveling four hundred miles from west to east to pass from a tropical region in which it never rains through temperate and frigid regions down into the Amazon basin, where there are torrid heat and much rain. It thus seems possible to duplicate within a very small area the climatic or morbific conditions of anywhere in the world. Most large tropical land areas have mountains or elevated plateaux which furnish temperate zone conditions of heat and moisture. On the whole, however, the band of earth which we call the tropics is marked by greater sustained heat and greater humidity, and as these are the good incubator conditions already mentioned, we may therefore appreciate why tropical regions are better equipped than are colder climates to propagate a healthy and truculent disease-causing flora and fauna.

It may be added that this region of South America of which we are speaking has succeeded in developing at least two human infectious diseases, which, so far as known, do not occur in any other part of the world. One of these is called oroya fever and the other Peruvian wart.

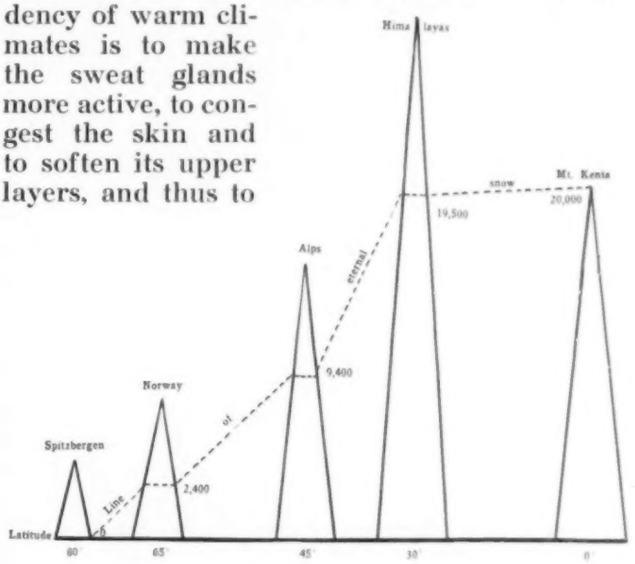
Every good laboratory, in addition to having incubators for sustaining favorable temperatures for growth, is provided with means for holding in abeyance the growth of microscopic life. This apparatus is the refrigerator. The laboratory of the earth is also thus provided, for at the snow line and above all forms of minute life are held in abeyance. The snow line descends as we go north or south from the equator until at about 80 degrees north and south latitude it reaches the sea level. The accompanying chart from Le Dantec will show this at a glance.

At the equator an altitude of three hundred feet corresponds to one or two degrees (from seventy to one hundred and forty miles) displacement toward the poles, and an elevation of six hundred and sixty feet corresponds roughly to one thermometric degree Centigrade of cold.

As a class, diseases caused by bacteria are little affected by latitude, for the reason that the temperature requirements of their viruses are those of their hosts, and these in warm-blooded animals remain constant whatever the atmospheric temperature may be. Typhoid fever and leprosy and tuberculosis may accordingly be found wherever man may live. Many of the diseases caused by bacteria are, nevertheless, much more common in warm climates, and this is explained by the crude ideas which tropical peoples in general have with regard to sanitation and personal hygiene.

A curious instance of geographic limitation of one of this type of infections is that of Malta fever. It was shown a few years ago that only persons who use goat's milk as food are liable to this infection, and this discovery at once explained the peculiarities in geographic distribution of this disease.

Mycotic diseases, those caused by molds, are world-wide in their distribution, but are more common in warm humid climates. The tendency of warm climates is to make the sweat glands more active, to congest the skin and to soften its upper layers, and thus to make conditions more favorable for the growth of parasitic fungi. Many mycotic diseases of the skin are commonly called ringworm.



The relation of climate to altitude and latitude. (After Le Dentec.)

Protozoal diseases are much more common in warm climates than in cold climates, and the reason is that many of these depend on intermediaries for their transfer from host to host. Even the organisms not transferred in the manner just mentioned, however, find more suitable conditions in warm than in cold climates during their critical period of transfer from host to host. Thus the organism of amebic dysentery which parasitizes after being swallowed as a resistant form called a cyst, finds the mild temperatures of the tropics most suitable for prolonging the vitality of this cyst. On the other hand, the louse-borne disease typhus fever, also probably of protozoal origin, doesn't occur in hot climates, because the body louse, which is its intermediary host, does not propagate well where atmospheric temperature and humidity are constantly high.

When it comes to the higher forms of animal parasites we find that certain of these are more widely distributed in warm climates, while others are more often met with in temperate climates. Still others are fairly generally distributed. Some of the nematodes, roundworms, are dependent on insect intermediaries and are therefore most common where insect life thrives best, which is in the warm belt of the earth; filariasis is an example. Other roundworms which infect by ingestion of the ova find in the lax habits and filthy conditions of the food of tropical races the best opportunity for transfer from man to man. Thus while ascariasis is a cosmopolitan disease, it does its greatest damage in warm climates. Another of the diseases caused by nematodes and called trichinosis is conveyed by undercooked meat (pork) and is liable to occur wherever this is used as food. Trichinosis is rather common in north Germany, where raw pork sausage is considered a delicacy.

On the other hand, the cestodes, tapeworms, the acquisition of which usually depends on animal foods, such as pork, beef, and fish, in which the parasites find suitable hosts for their larval stages, are rather generally distributed, and their geographic distribution is dependent on the type of animal food consumed and on racial habits as to thoroughness in cooking such food. The most common tapeworm of man is an exceedingly slender worm about one half inch long which requires no intermediary, and is a rather common parasite of children. This is the so-called dwarf tapeworm of man.

When it comes to flukes, trematodes, we find that many of these depend on mollusks or fish or both in order to get from man to man, and they are usually exacting as to the species of intermediary which matures their young stages. The geographic distribution of the diseases which they cause depends on that of their respective intermediaries and on the strictness with which the parasites depend on these particular intermediaries. The diseases referred to under the name schistosomiases are caused by trematode animals commonly spoken of as blood-flukes. Eastern and southern Asia and Africa are the geographic areas where fluke diseases thrive best.

The achievements of three eras have served to make man the master of all living things. The first of these was the development of the capacity to approximate his thumb to his fingers; this enabled him to use a club for defense and for taking animal food. The second was the development of the use and control of fire which made him the potential master of his parasites. The third was the development of knowledge of the causes of disease and how these agencies are transferred from man to man. This will result in opening all the tillable areas of the world to cultivation, thus enabling the earth to carry its greatest load of living things.

"CONQUERING THE HOOKWORM IN BRAZIL"

"Brazil is one vast hospital," Dr. Miguel Pereira declared in 1916. And the result of the survey of the Rockefeller Foundation in that year was proof of the statement. For twenty-seven years before various South American physicians had urged government action in fighting the hookworm, but with little encouragement. Then in 1916 the president of the state of Rio de Janeiro invited the International Health Board to install a post in his state. The story of the work accomplished by the Foundation is told in the March number of *Current History*. The survey among 30,000,000 people showed that in some tropical regions 100 per cent. of the population was infested with hookworm. The ratio dropped in regions of colder temperatures, higher altitudes, and economic development other than of the land. Brazil is a country largely devoted to agriculture; her country laborers have a low standard of living and sanitation; the result is almost general infestation with hookworm. The ignorance of the people is the first difficulty to be overcome in the effort to rid them of this thief of health and energy. Native physicians and assistants conduct the local campaigns. Talks are given to school children, teachers, and other groups of citizens. "Among a population as illiterate as that of rural Brazil, the doctor's word and the screen is the only way to reach the masses." A "hookworm movie" is an attractive aid. The general recognition of the value of the Foundation's work has been expressed in earnest support. In 1916, not one cent was being spent for rural sanitation in all Brazil. In 1921, the federal and state governments appropriated $2,300,000 for that purpose. Rural health work is being carried on in all but three states, and in many the Rockefeller Foundation has withdrawn and turned over its activities to the state authorities.

Scientific Nutrition and Public Health

I. Is There a Nutrition Problem, and if So, What Kind?

E. V. McCOLLUM

IT is scarcely possible at the present time to discuss scientific nutrition in its relation to the public health without incurring the criticism of many medical and other scientific men. This is inevitable because the subject is so young and its growth has been so rapid that only a few experimenters have been in sufficiently close touch with this fast-growing fledgling in the brood of sciences really to understand the value of the experimental data available, to know where error has crept into theory, and to have witnessed convincing experimental proof of the importance of a properly planned diet. The temptation of these experts to speak in extravagant terms of the importance of their specialty is very great, and if they yield they lay themselves open to unfavorable judgment by those best able to judge, for medical men and scientists are necessarily conservative. It cannot be otherwise, for history affords many illustrations of brief and meteoric careers of those who have come forward with extravagant claims of wonderful discoveries. So much has been written in recent years of experimental studies in nutrition that it cannot but be profitable from time to time to take stock of our knowledge in this field, and to try to place it in its proper position among the agencies which can contribute to human health and happiness.

E. V. McCOLLUM, Ph.D., for many years a research worker in nutrition and diet, is professor of biochemistry in the School of Hygiene and Public Health of Johns Hopkins University. Dr. McCollum wishes every one to know of the abnormal development of children fed on faulty diets and the quick response of their bodies and minds when such diets are corrected.

Nutrition Generally Ignored

In justification of the statements in the preceding paragraph, we may properly undertake first to show that among medical men and experts in the medical sciences, there is skepticism concerning the importance of the chemical quality of food for the best physical development and the maintenance of health. We may fairly accept as representative of the views of physicians and public health workers the advice to the lay public in Bulletin 1 of the "Keep Well Series," from the United States Public Health Service (1919). On page 3, under the heading How to Prevent Sickness is the statement: "There is nothing mysterious about the prevention of sickness. Clean homes, clean food, clean hands, clean teeth, clean milk, pure water, fresh air, sanitary privies, war on flies and mosquitoes—their cost is trifling, yet they work wonders and will prevent much sickness." Throughout the bulletin bacterial infections and physical defects are stressed, and emphasis placed on the wisdom of early consultation of a physician for their treatment and correction. The list of infections and defects is complete, but there is no recognition of modern research in nutrition as a factor in their development and prevention. It is not intended to convey the idea that the United States Public Health Service does not interest itself in nutrition problems. Quite the contrary is true. Its researches on the relation of the diet to pellagra are noteworthy. What we are asserting is that this great federal bureau is apparently not yet prepared to assert that any specific advice to the public concerning what to eat is warranted as a public health measure, excepting perhaps in the prevention of pellagra. What has been said of the bulletin in question is typical, in the main, of educational matter that emanates from health laboratories and from the laboratories of public health workers the country over. The part of public health that is not prevention through the methods of bacteriology or medical zoology (hookworm, malaria, yellow fever) is essentially the salvaging of damaged human material through treatment, either medical, surgical, or dental. Scientific nutrition has yet to win its place as a public health agency.

Under normal conditions of supply and normal conditions of health, the cost and the sense of taste determine in great measure what and how much is eaten. Many persons believe that men and animals have instincts which are safe guides in selecting food, and that under normal conditions they will escape the dangers to which, according to modern scientific discovery, they are constantly exposed, but of which we were until recently unaware. They believe that with a suitable variety of foods to select from there will be no cause for alarm, since under these conditions malnutrition will be avoided.

Suitable Diet Not a Matter of Taste

One school of students of nutrition believes that this view warrants contradiction and that it cannot be defended successfully. In the laboratory of the School of Hygiene and Public Health of the Johns Hopkins University, it has been the usual experience that rats fail to make a satisfactory selection of food when offered a considerable variety, and that they can be nourished more successfully when their diets are planned with the aid of a knowledge of the chemistry of foods and the demonstrated nutritive needs of the species, than when the animals are left to choose for themselves from various lists of foods. For example, young rats grow well on a mixture of fifty parts of corn meal, thirty parts of alfalfa leaf flour, and twenty parts of cooked peas; these three ingredients are ground together so finely that they must be eaten in the proportions named. We have reared four successive generations of a single family on this diet as the sole source of nutriment, and without evidence of diminished vitality. Animals of this family made an almost complete failure of their nutrition when offered in separate dishes corn, alfalfa flour, and cooked peas. They liked the taste of the corn better than either of the other foods, and therefore they tried to live largely on corn alone, with disastrous results.

Recently we suggested two dietary formulas to investigators in other departments, whose studies were in other fields, and who wanted to be certain that their animals were nourished in the best possible manner. In one instance, through misunderstanding, the several components of the diet were mixed roughly and without grinding, so that two or more of the individual foodstuffs could easily be picked out by the rats and eaten separately. This ration, when finely ground so that the entire mixture had to be eaten or left alone, maintained excellent nutrition in rats, but it proved a failure under conditions allowing a choice of ingredients. In the other instance, a laboratory helper persisted in adding cracked corn to a food mixture which was an excellent diet. The rats liked to pick out these particles of corn, which they enjoyed chewing, and refused to eat much of the remainder of the diet, which was so finely ground that it did not give satisfaction in mastication. Their nutrition was so poor as to be disappointing to the experimenter, until the cause of the trouble was discovered. The rats then thrived when compelled to eat the finely ground mixture, even though it was unattractive to them because of its physical condition.

Appetite Not a Guide to Amounts Needed

A few years ago, classes in nutrition were instructed, mainly in digestion, protein requirements, and energy requirements of the body; today these factors are regarded as comparable in importance, but not of greater importance than quality of food protein, composition of the inorganic or mineral portion of the diet, and content of the several vitamins. It was then the custom to give much attention to the caloric or energy requirements of men and women living and working under various conditions, and of children of varying ages. Today, there is a strong tendency to leave to the appetite the task of determining how much food shall be eaten, but to refuse to trust the appetite to determine the quality of our supply of nutrients.

Common experience teaches us that we are hungrier after a period of hard work than when we have been idle for a similar time. Work requires energy, and this is furnished by the food, just as fuel furnishes the energy for an engine. When the energy reserves of the muscles, which are in the form of glucose, a form of sugar, and glycogen, a starch-like substance, run low there is response by the alimentary tract which we recognize as hunger. This is due, in the main, to contraction of the muscles of the stomach to the point of discomfort. It is relieved by taking food or drink. But how many persons could be convinced that the appetite is satisfied when one has had as much to eat as is good for him? The sad experience of children and adults on Thanksgiving and Christmas days with their sumptuous dinners is quite sufficient to convince any critical observer that, in the healthy person, we can only trust the appetite to make a demand for food at the proper time, not to give notice when he has had enough. At least the warning is a gentle one and needs to be enforced by judgment. Pliny said, "Their best and most wholesome feeding is upon one dish, and no more and the same plaine and simple; for surely this hudling of many meats one upon another of divers tastes is pestiferous. But sundrie sauces are more dangerous than that." Who can doubt that the eminent Roman was speaking from sad experience with the difficulty of controlling his appetite?

Another evidence that the appetite is not a safe guide either to the body's need for food or to quality in food is seen in the prevalence of fat persons, especially women, at the present time. The accumulated experience of all life insurance companies shows that excessive weight is detrimental to health and markedly decreases one's expectation of life. Persons who do not exercise much overeat and grow fat to their disadvantage. Again, the appetite fails and plays sorry tricks when it fixes the habit of a love for excessively sweetened foods, alcohol, tea, coffee, and other caffein-containing beverages.

Habit is a most important factor in determining what the appetite will demand. Throughout the southern states people like bread made of corn meal and eat large amounts of it. It

was found in a dietary study to constitute 23 per cent. of the entire food of Tennessee and Georgia mountaineers, and 32.5 per cent. of that of southern negroes, whereas seventy-two northern families in comfortable circumstances derived but 1.6 per cent. of their food supply from this grain. Those who grow up with corn bread as a prominent article in their diet learn to like it. The French people could not bring themselves to eat corn even under the pressing conditions of food scarcity during the Great War, simply because it was new to them. The Chinese and Japanese and other Orientals greatly prefer rice to wheat as a food grain, and, very strangely it seems to us, they like polished rice better than unpolished, notwithstanding the fact that the former is a very deficient food and causes them to develop a very serious and often fatal disease of nutrition known as beriberi. Those who espouse the cause of defending the appetite and instincts as safe guides in selecting diet which will promote health will find themselves defending a lost cause.

Physical Abnormalities the Result of Faulty Diet

All of the numerous investigators who have, during the last few years, examined school children in almost every part of the country agree that from 10 to 40 per cent. of children in our public schools at the present time are suffering from malnutrition of an easily recognizable grade. This is manifested by conditions such as underweight for age, anemia, chronic fatigue, faulty skeletal development, bad teeth, faulty posture, and nervousness. Every one knows that in the average American home children are allowed to follow rather freely the dictates of their appetites, and that they are with few exceptions provided with a considerable variety of foods such as are sold in grocery stores. Why then are these children so frequently undernourished? Some persons assert that it is because of infected tonsils, adenoids, and other conditions which can more or less successfully be remedied by the surgeon or the physician. Other investigators hold the reverse view, that the physical abnormalities are the sequel of faulty nutrition caused by restricting the diet for some time to a list of foods which are, singly or collectively, inadequate for the maintenance of normal nutrition. They contend that the difficulty lies in the fact that the children's food is not of the proper chemical composition, that the failure of health and growth, the development of infections in the tonsils, the growth of adenoids, and the formation of bad postural habits are explainable on this basis. The development of the body is poor, and consequently the resistance to infection is low; faulty posture is attributable to lack of strength in the muscles. The remedy does not lie, therefore, in insistence on a correct posture regardless of the physical powers of the child, but on building up vitality through the provision of a satisfactory diet. This idea has been acted on in many cities, and a suitable diet supplied the children; the growth resumed by the children who had come to a standstill physically and the easily noticeable improvement in their health and vigor and capacity to learn cannot be attributed to any other cause than the change in diet. That this point of view is founded on sound evidence will be further supported in later articles by results of experiments on animals and other proof.

[The second paper in this series will appear in the June issue of Hygeia.]

PLUTARCH'S RULES FOR DIET

He that is hungry should eat necessary food and find it pleasant; but when he is freed from his common appetite, he ought not to raise up a fresh one. For as dancing was no unpleasant exercise to Socrates himself, so he that can make his meal of sweetmeats or a second course receives the less damage. But he that has taken already what may sufficiently satisfy his nature ought by all means to avoid them. And concerning these things, indecorum and ambition are no less to be avoided than the love of pleasure or gluttony.

Therefore, when any rare or noble dish is before you, you will get more honor by refraining from it than partaking of it. Remember what Simonides said, that he never repented that he had held his tongue, but often that he had spoken; so we shall not repent that we have refused a good dish or drunk water instead of Falernian, but the contrary. We are not only to commit no violence on nature; but when any of those things are offered to her, even if she has a desire for them, we ought oftentimes to direct the appetite to a more innocent and accustomed diet, that she may be used to it and acquainted with it. . . .

Garden Cities of Health

JAMES A. TOBEY

GARDEN cities! The term brings to mind well built towns with picturesque new houses on clean wide streets, fringed with parks and gardens. Such towns are the industrial communities constructed by philanthropists to house workmen in a pleasant and inspiring environment. They are zealous attempts to do away with the all too frequent squalor and misery of the living conditions of the laboring classes. They are efforts to introduce the sunshine into the lives and into the hearts of these people of a previously submerged group. As such, they have an honorable place in human progress, for they bring health and happiness.

JAMES A. TOBEY is the representative at Washington of the National Health Council, which includes in its membership many of the health associations in the country. The work carried on by the health demonstrations in the communities which Mr. Tobey describes may be duplicated with the same happy results in any community of earnest people.

There is, however, another type of garden city, an even more important type. It is not characterized by rows of new houses set in symmetrical lines. There is, in fact, very little change in the outward aspect of the community. It is much the same that it has always been. But there has been a definite and dramatic transformation. It is revealed in certain figures known as death rates and sickness statistics. In other words, the change has been in the health of the people. People live longer and better, fewer die from preventable causes, and there is less disease. These are the garden cities of health, these are the real flowers of our civilization. Their story carries all the romance, all the glamour of the famous cities of all time. Who would exchange one of these garden cities for Babylon or Nineveh, for Carthage or Cnossus, for Athens, Rome, or Venice?

The most notable of these cities of health have been and are those where the so-called health demonstrations have been carried out or are under way. The care of the public health is primarily a governmental responsibility. No one denies the duty of health administration to the community itself. There are some things the authorities cannot always accomplish, however. Often they are handicapped by lack of funds, often by absence of trained leaders, sometimes by politics, occasionally by constitutional or legal limitations, and now and again by public apathy and nonsupport. A voluntary, nongovernmental agency then comes along and says, "Here, we will demonstrate to you, at our expense, the value of this work, and when it has become well established, and you have seen and been convinced that it is worth while, we will withdraw and you may take over the work." In this way many estimable projects have been launched and later adopted by the communities. Public health nursing, for instance, has largely developed in this manner. No sanitarian today denies the value of the public health nurse, and all the people have come to realize the beneficent results which follow the visits of these couriers of good health.

Tuberculosis Demonstrations, an Experiment

A number of health demonstrations have been staged in several American cities. A noteworthy tuberculosis demonstration is approaching its termination at Framingham, Massachusetts; an experiment in child health is now being conducted at Mansfield, Ohio, and another will start soon at Fargo, North Dakota. Several more of these special tuberculosis campaigns are to be held in New York, and intensive rural hygiene demonstrations are going on in Maryland and other states. These civic laboratories have shown how communicable disease can be reduced by the application of science and how the span of human life can be lengthened by intelligent use of the principles of preventive medicine.

About five years ago a New England town was selected for the first of these famous demonstrations. Early in 1916, Dr. Lee K. Frankel, third vice president of the Metropolitan Life Insurance Company of New York, wrote to the National Tuberculosis Association and stated that his company was willing to appropriate one hundred thousand dollars for an experiment to show how to control tuberculosis. The offer was accepted by the Association, and Framingham, Massachusetts, a city of about 16,000 population, twenty-one miles west of Boston, was chosen for the work. The experiment began January 1, 1917, under the direction of Dr. Donald B. Armstrong, who managed the work under the general supervision of a committee of distinguished experts in antituberculosis measures. The program was originally for a three-year period, but at

the end of this time a committee appointed to appraise the accomplishments of the demonstration recommended that it be extended for several years. The Metropolitan Life Insurance Company accordingly made another appropriation for several more years.

Physical Examinations of Residents

When a new business is acquired, one of the first things to do is to take an inventory. Several months after Dr. Armstrong arrived in Framingham, he proceeded to take stock of the amount of sickness there. An intensive survey showed the exact conditions. This health census, made by nurses and special agents, enumerated over 6,500 persons and allowed accurate estimates to be made as to the amount of disease, especially tuberculosis, in the community. Following this sickness survey, a medical examination campaign was conducted. Later in 1917, a second examination drive was held. In both of these nearly 5,000 persons were examined by physicians, mostly in their own homes at the expense of the demonstration. It was found that 77 per cent. of those examined had some physical defect, and that 64 per cent. of these defects were directly preventable. Thus, many persons who had been living relatively ineffective, if complacent, lives discovered that all was not as it should be with the human machine, and that it needed a certain amount of overhauling.

The school children of Mansfield, Ohio, are to be examined periodically. They know the average weight and height which they are expected to reach.

Survey of Schools and Factories

Not only were many persons examined, but also the places in which they worked and where the children went to school. Sanitary surveys were made of all the schools and factories, and conditions detrimental to health which were discovered were reported to those in charge, to be promptly remedied in most cases. The modern employer realizes the importance of providing hygienic surroundings, for that means better production, which can be readily translated into dollars and cents.

A children's summer camp was another activity established by the demonstration. The objects of this play camp were to build up greater vitality by contact with that best of all medicines, the open air; to teach hygienic principles to the children, lessons which often resulted in improvement of sanitation in the homes; and, finally, to provide rest for mothers who had to work. The children were properly supervised and the results have been that there are in Framingham many far healthier and happier children. It is remarkable how these words "health" and "happiness" always go together. And they always do.

The Check on Tuberculosis

The primary interest of this whole demonstration, of course, was to show how tuberculosis could be conquered. Statistics revealed that for the ten years preceding the demonstration the corrected death rate from tuberculosis in Framingham had been 121 deaths for each hundred thousand population. During 1917 it was 93; in 1918 it fell to 79; in 1920 it was further reduced to 64; and in 1921 it was only 40. In other words, the death rate from the great white plague had been reduced

The programs for Mansfield, Ohio, and Framingham, Massachusetts, include plans for children's play indoors and out. The children of Mansfield enjoy staging a health play.

by two thirds in five years in this New England town. The achievement is all the more remarkable when it is considered that the rate for the whole United States in 1921 was about 100 for each hundred thousand population, as compared with the rate of 40 in Framingham. This proves what science can do.

Facts Learned from Health Demonstrations

This notable demonstration has established several facts. First, it showed how much tuberculosis there is in an average American community. The authorities in charge at Framingham found that for every death from the disease there were at least nine active cases. Second, the experiment showed that the best way to cope with the problem is by the development of civic machinery for the early detection of the disease, followed by proper hygienic care of those having it. In this connection, a medical consultation service had an important function. Third, the town itself appreciated the benefit brought by the demonstration. It responded heartily to the call for better health by increasing the expenditures for health work from 40 cents to $2.25 for each person every year. In order to control tuberculosis, a broad general health program under the auspices of local authorities is needed as much as the intensive work against this one disease. What has been accomplished in Framingham can be done elsewhere. All that is needed is civic pride and public interest, an interest that will not hesitate to spend a little money in buying that which pays the highest dividends in the world, for as Emerson said, "The first wealth is health."

New Health Demonstrations Being Planned

Not to be outdone by this demonstration, another altruistic body has come forward with an appropriation to finance a number of health and tuberculosis experiments. The Milbank Memorial Fund of New York has announced through its secretary, John A. Kingsbury, that practically the entire income of ten million dollars, left by the late Mrs. Elizabeth Milbank Anderson, will be devoted to demonstrations for health and against tuberculosis in New York State during the next five years. The site for the first demonstration will be in one of the cities of Cataraugus County, and the second at Syracuse, New York. The active cooperation of the state health department and the State Charities Aid Association has been enlisted and these organizations will assist in the administration.

An enthusiastic writer in a popular magazine recently called the children of Mansfield, Richland County, Ohio, "the luckiest kids in America." The reason for this ardent phrase was the fact that this community had been selected as the happy scene of another of these health demonstrations. This one is not aimed at tuberculosis, but is devoted to the whole field of child hygiene. It is made possible by a grant of $200,000 from the American Red Cross and is under the jurisdiction of the National Child Health Council. The demonstration began in November, 1921, under the able leadership of Dr. Walter H. Brown, a successful city health officer. Richland County

is a typical agricultural region in the Ohio wheat belt and has a population of about 55,000. Mansfield is a hustling industrial city of about 31,000. This locality was chosen from about eighty towns and cities which applied for the demonstration, because it represented good average American conditions. The period of this experiment is to be five years and its objectives are the working out of practical methods whereby the resources of national child welfare agencies can be made available to a community; the evaluation of the various means now used to better child health; a combination of the best of them into an effective local campaign; the training of workers for this task; and, finally, the demonstration of how any community in the United States can go and do likewise.

The health workers in Richland County have won the thorough confidence and hearty cooperation of every one in the county, including the medical profession, the parents, and the citizens in general. In order to learn just what were the conditions, the work was begun with a health census. This survey made possible a gage of the health needs. Then came the examination of more than a thousand children in the schools and effective organization of the public health nursing service. Education in health habits is another aim of the work. It is, of course, too early as yet to talk of results of this demonstration, for it has really only begun. It will be worth while to watch it carefully. What it discloses will have an important influence on modern methods of sanitary science as applied to child hygiene. And it should always be remembered that any city or town can stage for itself one of these demonstrations, if it so wishes.

Cooperation of National Organizations

In fact, some other towns are going to have similar demonstrations. The Commonwealth Fund of New York announced last June that it would finance a thorough child health demonstration in three cities for a period of five years. In order to administer this work a child health committee was formed, on which were represented this foundation, the American Child Hygiene Association, the Child Health Organization of America, the National Child Health Council, and the National Health Council. Courtenay Dinwiddie is the secretary of this committee. The first city chosen is Fargo, North Dakota, in the Upper Mississippi Valley. The demonstration will be in charge of Dr. William J. French and will be similar in many ways to that of Mansfield. The locations for the other two demonstrations have not yet been selected.

So far, we have been describing work undertaken under the auspices of national voluntary agencies. The federal government has also assisted in similar projects. For instance, during 1922, the United States Public Health Service detailed one of its medical officers to Hagerstown, Maryland, to conduct a rural health demonstration in Washington County. This work is done in cooperation with the state health department, the county public health association, the International Health Board, and the School of Public Health of Johns Hopkins University; it provides an excellent working laboratory for the students

At the Children's Health Camp of Framingham, the children wade for their health.

Two thousand school children at Mansfield, Ohio, give a health pageant at the county fair.

of the school. The Public Health Service has also stationed an officer at Cape Cod, Massachusetts, where eleven of the fourteen towns of that sandy peninsula have combined in a health unit. During 1922 it has been carrying on cooperative rural hygiene campaigns in fifty-six counties in sixteen states. An example of the results of this type of work, gleaned from a prosaic appearing annual report of the Service, is Madison County, Alabama. When the rural health activities were begun in 1918, this county had a death rate of 19 to the thousand of population. In 1921, it had been lowered to 12.6. Since the population of the county is about 50,000, this means approximately 350 fewer deaths a year.

Origin of Garden City Movement

The garden city movement seems to have originated in England about a score of years ago. A town was founded by a Mr. Ebenezer Howard on the site of an old village about thirty miles north of London. Curiously enough, the name of this village had been Letchworth, which was derived from the old English for "Leech's holding," or, literally, doctor's garden. In this town, surrounded by farming settlements which form an outer belt of pure air, the population is limited to 35,000 on an area of 1,300 acres, thus preventing overcrowding. No house may be more than two stories in height, nor may it occupy an area greater than one quarter of its garden. All property is thus restricted and long leases are granted. Milk and food come from the surrounding territory and are closely supervised. A writer in the *International Journal of Public Health* for October, 1921, stated that the birth rate in this garden city is 30 for each thousand, the general death rate only 5 for each thousand, and the infant death rate 34 for each thousand live births. These death rates are about one third the average in this country and in England.

These remarkable figures for birth and death rates of the English garden city have not yet been reached by any of the American demonstrations. It is, of course, difficult to make comparisons, on account of many different factors to be considered, but if the mortality can really be reduced to such a degree in England, we can certainly do it too, and the goal to be reached is all the more incentive. The health demonstrations in this country have produced very significant results, however, and have indicated what can and should be done by all of our communities. Perhaps we have said this before, but the repetition does no harm. Reiteration, the psychologists tell us, is the way to get a message over. If Framingham could reduce its tuberculosis death rate to such a marked degree, there is no reason why Pueblo, Brunswick, Canton, Fort Wayne, Emporia, New Bedford, Pontiac, Sedalia, Perth Amboy, Altoona, Beaumont, Roanoke, and Fond du Lac, to pick a few names at random, should not do as valiant a piece of work.

Garden cities of health! The term brings to mind quaint villages, nestling in the hills of New England, old fashioned towns in the fertile valleys of the Alleghanies, far flung settlements in the middle west, thriving communities of the southern plains; average American cities all, from the sea girt coast of Maine to the sunlit waters of the Golden Gate, from the snow filled plateaus of the north to the arid prairies of the south, from the wind swept lakes to the restless Gulf. The term inspires a vision of cities where man dedicates himself to the betterment of the race, where life runs a little longer, where "he who has health has hope and he who has hope has everything." It brings to mind the glory of springtime, where gardens blossom and the air is fragrant with flowers. And these cities of health are radiant with the sunlight of that springtime.

The Danger of Measles

VICTOR C. VAUGHAN

AFTER the discovery by Jenner of vaccination against smallpox, measles became the most prevalent infectious disease in the world. Before Jenner smallpox killed many children who had not even been exposed to measles. This led to some discussion, some persons holding that the suppression of smallpox increased the number of those having measles. One hundred per cent. of all people are susceptible to measles. Some persons do not acquire this disease because they are not exposed to it. Many do not have it until maturity, but age does not decrease susceptibility, although the time of life of infection is a matter of importance.

Dr. Vaughan knows from his many years of study of epidemic diseases that the danger of measles is invariably underestimated. Measles is one of the most infectious diseases of childhood and adult life. Among young children it carries a high death rate, and leaves survivors highly susceptible to pneumonia. The facts cited in this paper should encourage people to enforce rigid quarantine of patients with measles.

History

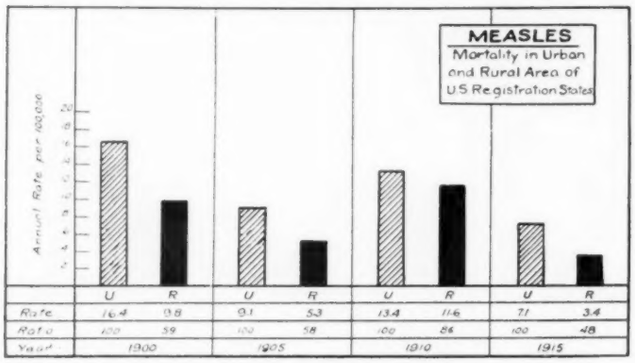
Undoubtedly measles is as old as the race, but it was first distinguished from smallpox in the tenth and eleventh centuries; we owe this differentiation to the observation of Arabian physicians. These keen observers recognized that having the measles did not give immunity to smallpox, and that having smallpox did not give immunity to measles. As a result of careful study of both diseases, they were able to point out the difference in the eruptions. Measles continued to be confounded with scarlet fever until the latter half of the seventeenth century, when the great English physician of that time, Sydenham, pointed out the difference in the symptoms and in the eruptions.

Incubation and Virulence

There is no other disease in which the time between exposure and the first appearance of the eruption is so constant and invariable. If, when your child develops measles, you wish to know the time when it was exposed, count back fourteen days from the time of the first appearance of the eruption, and you will get, within twenty-four hours, the exact day of exposure. Please understand that you must count the time between exposure and the first appearance of the eruption. The child is ill for from three to four days before there is any eruption.

For as many as sixty-five years after 1781 there was not a case of measles on any of the seventeen islands constituting the inhabited portion of the Faroe Group. During this period all imports and exports into and from these islands were handled by the Royal Danish Company, and a successful quarantine seems to have been maintained. In 1846, a man who had been exposed in Denmark reached the Faroe Islands and developed measles. At that time the total number of inhabitants of these islands was 7,782. Of these no exposed person, who had not had the disease sixty-five years or more previously, escaped the infection. The people were gathered in small villages of from twenty to two hundred persons. Thorshaven, the administrative capital, was the only village with a population of more than two hundred, and it numbered eight hundred. The measles carrier left Copenhagen March 20 and reached Thorshaven March 28 in perfect health. Fourteen days after the day of exposure the first sign of an eruption on him appeared. Men from several islands came in contact with this man and returned to their homes. Here they came in contact with almost every person in their respective villages, and fourteen days later all these came down with the disease. Ten men left a certain village and visited another, where they came in contact with the inhabitants. Fourteen days after exposure, when they had returned to their own village, every one of the ten showed the eruptions of measles. In a certain village of one hundred inhabitants eighty developed measles on the same day. No person who had had this disease sixty-five years or more previously developed it at this time. The commissioner sent from Denmark could not find an instance of a second attack of measles, although the shortest possible time between the previous attack and the present exposure was sixty-five years. This indicates that one attack of measles practically in every case protects from this disease throughout life. The weight of opinion is that all reports of two attacks of measles in the same person are founded upon errors in diagnosis. At least if a second attack of measles does occur it is exceedingly rare. However, this may depend upon the intimacy of contact.

The Fiji Islands were free from measles until 1875. The king of these islands at that time visited Sydney in New South Wales, Australia, with the purpose of transferring his government to the British Empire. While returning to his country on a British man-of-war in January, 1875, his son and one of his servants developed measles. The party landed at Levuka January 12. The ex-King had called


MEASLES
Mortality in Urban and Rural Area of U.S. Registration States
Annual Rate per 100,000
U R U R U R U R
Rate 16.4 9.8 9.1 5.3 13.4 11.6 7.1 3.4
Ratio 100 59 100 58 100 86 100 48
Year 1900 1905 1910 1915

Close contact of people in cities and towns probably accounts for the higher prevalence and death rate among them than among country dwellers. (From Vaughan, V. C.: Epidemiology and Public Health. Courtesy of Mosby.)

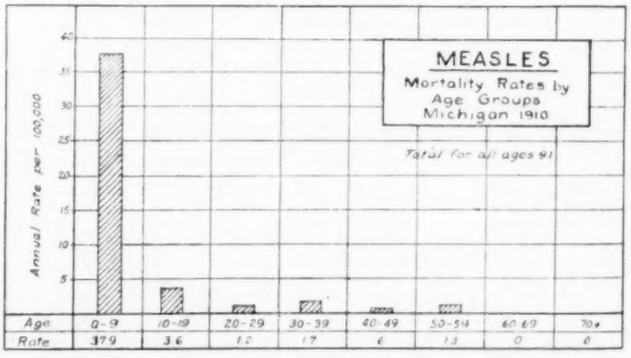
a conference of prominent men from all the islands. This conference was held during the second and third weeks after the arrival of the infected persons and all members of the conference were exposed. In this way the disease was spread throughout the entire population, which at that time numbered about one hundred and fifty thousand. It is officially stated that there were forty thousand deaths. In the islands and villages where the best records concerning the population and deaths can be secured, it appears that from 27 to 28 per cent. of the people died from this disease. By the end of May the epidemic had burned out. This experience has led to the inference that the high mortality was due to the introduction of a new disease among a susceptible people. Careful study of all the particulars concerning this epidemic leads us to conclude, however, that it was due to the lack of adequate care of those who acquired the disease.

Measles in Our Army Camps

Vaughan and Palmer, in a study of communicable diseases in our large army camps, have been able to make some important contributions to our knowledge of the epidemiology of this and other acute and infectious diseases. In some camps, notably at Camp Wheeler, at Macon, Georgia, were thousands of drafted men from rural districts who had never had measles. These men had been on troop trains on which they had spent from twelve to thirty-six hours on their way to camp. During the fall of 1917 not a train reached Camp Wheeler without from one to six fully developed cases of measles. Every man on each train had been exposed, and the susceptible men came down within fourteen days. The disease did not disappear until every susceptible man in the camp had developed it. With hospital accommodations for one thousand patients and with more than this number developing the disease in one day it was impossible to give the men adequate care. Moreover, all the attendants in the hospital who had not already had the disease developed it at the same time; this is why measles is so serious a disease in armies. The soldiers came down en masse, as it were, and while the hospital was not prepared to receive more than 3 per cent. of the entire division, several times this number were taken ill in one day.

Mortality

The mortality in measles varies greatly with the age and with the care that can be given the patient. Under six years of age the fatality from this disease is high even with the best of care. After nine years of age the mortality is low, provided proper care is given. Measles is not so deadly of itself, but it lowers the resistance of the patient and opens the gate wide for the introduction of germs causing other diseases. In our camps in this country during the World War the fatality from uncomplicated measles did not exceed 0.14 per cent., while in cases of measles complicated with pneumonia the fatality reached 27.1 per


MEASLES
Mortality Rates by Age Groups Michigan 1910
Total for all ages 91
Annual Rate per 100,000
Age 0-9 10-19 20-29 30-39 40-49 50-59 60-69 70+
Rate 379 36 12 17 6 13 0 6

Very plainly, children under six years should be especially protected from measles. (From Vaughan, V. C.: Epidemiology and Public Health. Courtesy of Mosby.)

cent. These facts teach two very important lessons. The first is that all children under six years of age should be protected from this infection. The second is that all patients with measles should be protected from other infections. The child, especially the one above nine years of age, who acquires the disease is not in much danger of losing his life, provided he is properly cared for, but he is likely to

carry the infection to the younger brothers and sisters at home, and it is among these that the greater danger of fatal termination lies. The younger children should be protected not only from persons having pneumonia and other diseases, but also from those who are in apparent health, because the apparently healthy often carry in their mouths the germs that cause pneumonia. In health these are not dangerous, but when transferred to the child with measles they carry great danger.

Early Recognition

Physicians place great stress on the early recognition of measles. Twenty-four hours, and in some cases more, before the eruption appears on the skin, known medically as exanthem, there is a characteristic eruption in the mouth, known medically as enanthem. This, however, would not be recognized by the mother or the school teacher. A certain earlier symptom may serve. When a child of school age has reddened, suffused eyes, and a temperature of 99.5 F. or higher, measles should be suspected and the child should be quarantined, temporarily at least, and by all means kept apart from the younger children in the house.

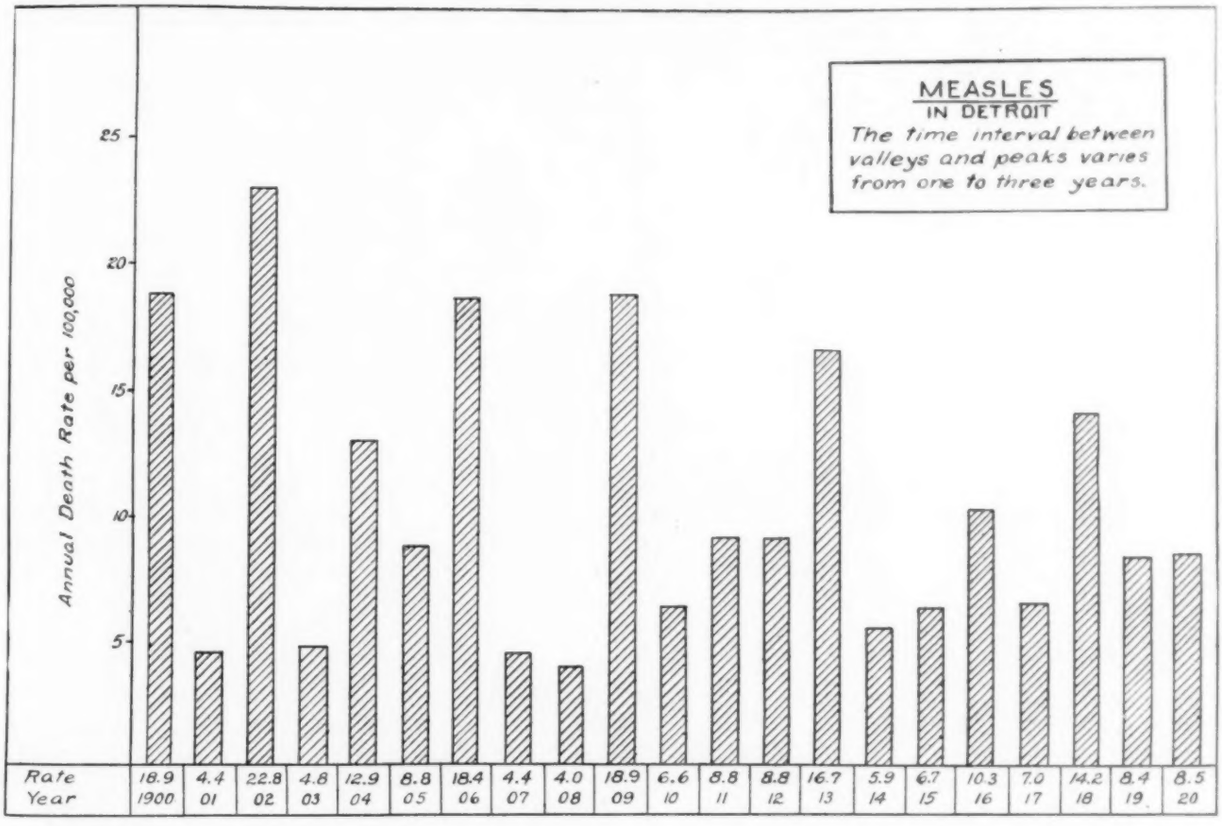
Periodicity

While measles is constantly present in every large community, it tends to become epidemic every two years. The usual explanation for this is that during this time a new group of susceptible children comes into existence. Another explanation is that the poison of measles passes through a cycle of varying intensity. It grows old, becomes less active, passes through a stage of comparative inactivity, and then is reborn, or reaches another new and more virulent generation; it requires about two years to pass through this cycle.

Measles and Pneumonia

Vaughan and Palmer, in the studies referred to, have shown that not only men who have recently had measles are unusually susceptible to pneumonia, but also are more liable to die from the pneumonia. They say that measles not only predisposes to pneumonia; it predisposes to fatal pneumonia. The relationship of measles to pneumonia may be brought out by the following facts:

1. Of every thousand men in the army who had measles, forty-four had pneumonia, and nineteen died.
2. Of every thousand men in the army who did not have measles, seventeen had pneumonia and two died.
3. A person who has recently had measles is ten times more liable to die from pneumonia than is the person who has not recently had measles.



Fortunately, the peaks in death rate from measles are becoming lower. (From Vaughan, V. C.: Epidemiology and Public Health. Courtesy of Mosby.)

"PATENT MEDICINES"

II. What Protection Does the National Food and Drugs Act Give?

ARTHUR J. CRAMP

UNTIL within recent years the makers and sellers of "patent medicines" in the United States were for all practical purposes above and beyond the law. It is true that a few of the states had laws that, nominally at least, exercised some control over the sale of products offered to the public for the relief or cure of human ailments. Virtually, most of these laws were dead letters. Of federal control there was none, for there was no national law on the subject.

In this the second paper of his series, Dr. Cramp, head of the Propaganda Department of the American Medical Association, describes the powers and limitations of the "Pure Food and Drugs Law" in protecting the public against dangerous patent medicines and false claims made for them. Here may be found the explanation of the fact that the claims made in advertisements for a "patent medicine" are not always the same as those on the package.

Persons interested in the health of the public had for years attempted to get on the federal statute books a law that would protect the people from the sophisticator of foods and the adulterator of drugs, but without success. The forces of evil were too strongly entrenched and the public itself, ignorant of the way in which it was exploited, was apathetic. Finally, through the efforts of the medical profession, public health officials, and other public-spirited men, Congress, on June 30, 1906, passed the National Food and Drugs Act. The law went into effect January 1, 1907, and was popularly known as the Pure Food and Drug Law.

What the Law Does

Although the National Food and Drugs Act has been in force for more than sixteen years there is still much misapprehension of its powers and limitations. While the law applies to both foods and drugs, we are interested at this time only in its application to those drug products we call "patent medicines." Without going too technically into the subject, it may be said that the National Food and Drugs Act exercises the following control over "patent medicines":

1. It prohibits "false or misleading" statements (on or in the trade package) regarding composition or origin.

2. It prohibits, through the Sherley amendment, "false and fraudulent" statements regarding curative effects.

3. It requires the label to declare the *presence* and *amount* of eleven drugs and their derivatives: alcohol, morphine, opium, cocaine, heroin, alpha-eucaine, beta-eucaine, chloroform, cannabis indica, chloral hydrate, and acetanilid.

It should first be understood that the law, being a federal one, can apply only to products that enter into interstate commerce, that is to those that are made in one state and sold in another. A "patent medicine," for example, that is made in New York City and is sold only within the confines of the state of New York does not come within the scope of the National Food and Drugs Act; one that is made in Chicago and is not offered for sale outside of Illinois cannot be reached under this federal law. Such products are amenable to the state law, provided the state has a law on the subject as, today, most states have.

The Sherley Amendment

The thoughtful reader may have noticed that there is a difference in what constitutes violation of the law, first, as to claims for composition and origin and, second, as to claims for curative effect. In the former case a medicine is misbranded if the manufacturer or seller makes claims that are "false or misleading." In the case of curative effects, however, "false or misleading" claims are not sufficient to constitute misbranding; they must be "false and fraudulent." It is worthy of note that, in this latter case, falsehood alone will not procure conviction; deliberate *intent to defraud* must also be proved. How this state of affairs came about makes an interesting chapter in "patent medicine" history.

The law, as originally passed, declared a "patent medicine" misbranded within the meaning of the act if the label bore any statement which was "false or misleading in any particular." The officials whose business it was to enforce the law assumed that this meant literally what it said, and that the phrase "in any particular" included within its scope all claims made, including those for curative effect. The majority of "patent medicine" makers also assumed that this is what the law meant and modified their labels accordingly. The exploiter of a "cancer cure," however, took exception to this interpretation and when prosecuted by the federal officials he contended that the law did not apply to claims for curative effects. The trial court upheld this contention, and when the matter was carried to the United States supreme court, this august body, in a divided opinion, affirmed the findings of the lower court.

This staggering blow to the law caused a nation-wide protest and President Taft immediately submitted a message to Congress urging that the law be so amended as to rectify the weakness found in it by the highest court in the land. As a result, the Sherley Amendment was passed. This amendment specifically declares that a drug is misbranded within the meaning of the act if "false and fraudulent" curative claims are made for it. The amendment, it will be noticed, is, from a legal standpoint, weaker than the body of the law. If a "patent medicine" exploiter misrepresents the composition of his preparation, it is only necessary to prove that he has made either a "false *or* misleading" statement in the matter. Should his misrepresentation be along lines of curative claims, the federal officials must prove to the satisfaction of the court that the claims were both "false *and* fraudulent," which means, in the eyes of the law, that they were made with *intent to defraud*. This wording was not originally suggested by the author of the amendment, but was a compromise brought about by pressure from the "patent medicine" interests.

Before the Pure Food Law went into effect the Piso label (left) read a "Cure for Consumption"; after it became illegal to lie on the label, the preparation became (right) "A Remedy for Coughs and Colds," and the manufacturer had to admit that the product contained chloroform and cannabis indica.

The manufacturer of "Blackburn's Castor Oil Pills," which were not castor-oil pills at all, pleaded guilty to violating the federal Food and Drugs Act and it became necessary for him to change the name of his preparation. He changed the name but hardly the pronunciation. "Castor Oil Pills" became "Casca Royal Pills.

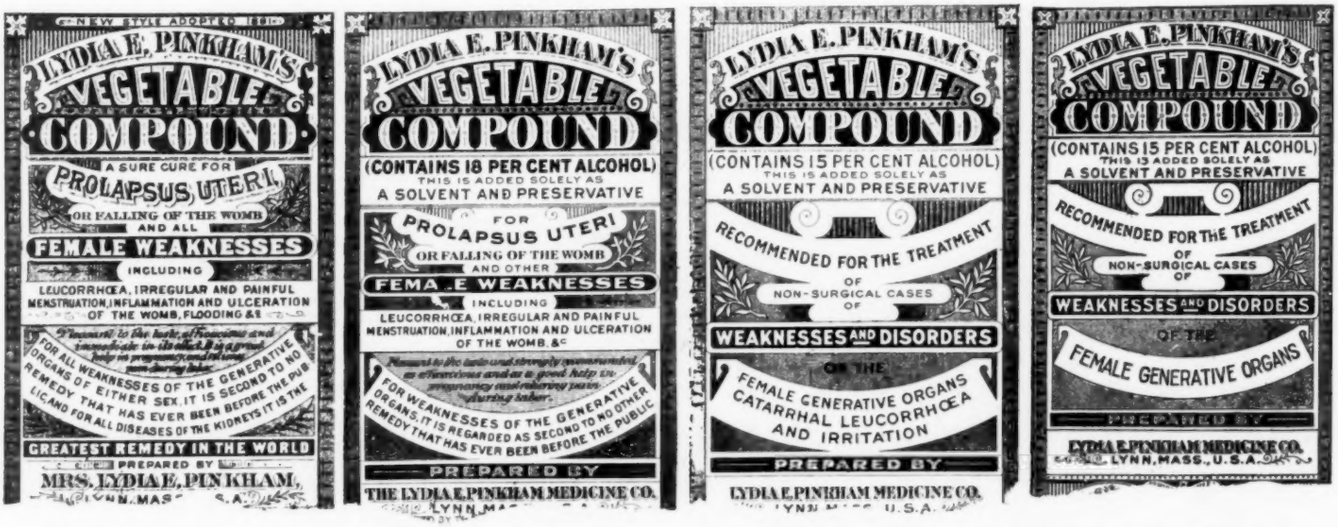
What Is the Label?

Another interesting chapter in the enforcement of the Food and Drugs Act is that dealing with the interpretation given to the word "label" in the law. At first many "patent medicine" sellers assumed that the term label applied literally and narrowly to the piece of paper pasted on the bottle or the box. These concerns revised the labels of their products, eliminating the false statements previously made, but they continued to misrepresent in the circulars which were wrapped about the bottles or boxes. They soon found to their cost that the courts interpreted the word "label" in a rational sense rather than a strictly technical sense, and held that it included the entire trade package and all it contained.

What the Law Does Not Do

So much for the powers of the law relative to "patent medicines." Now for its limitations. It has already been pointed out that the law controls only interstate (between states) business and does not control intrastate (within the state) business. This is one of its limitations and one that, under our constitution, cannot be remedied. For the constitution specifically delegates certain police powers to the individual states. But there is a much more serious limitation that could be remedied; that which confines the penalties for false,

misleading and fraudulent claims to those made in or on the trade package. The law in its present form does not penalize the "patent medicine" maker who makes the most outrageously false and fraudulent claims for his product in newspaper advertisements, or on bill-boards or in circulars distributed in drug stores. Yet these are the very avenues of publicity through which the public is swindled. It is the newspaper advertisement, the bill-board, or the circular distributed from door to door or at the drug store that sells the preparation and not the claims on the trade package which the public does not see until after the sale has been made. One thing this unfortunate limitation of the law does do; it permits one to arrive at an approximation of what is false. Here is the method: From the claims made in the newspaper advertisements subtract the claims made for the same product on the trade package; what is left, one is justified in assuming, is falsehood!



Study these four labels of different dates. On the extreme left is the label of the old days before the Food and Drugs Act. The stuff was then a "Sure Cure" for conditions that no medicine taken internally could cure. After the law came into effect the "Sure Cure" was removed from the label, and the admission made that the compound contained 18 per cent. of alcohol. Later the alcohol was cut down to 15 per cent. and the claims were still further modified.

Naming a Few of the Ingredients

So much for the limitation of the law as it applies to claims made for "patent medicines." It is further limited in the protection it gives the public against dangerous drugs. As has already been shown, the law requires the declaration of the presence and amount of only eleven drugs and their derivatives. Further than this no information is required of the manufacturer. Such deadly poisons as strychnine, aconite, prussic acid, carbolic acid, arsenic, and any of a score of others equally dangerous may be put into "patent medicines" and the public be none the wiser. Next in importance to modifying the law so that it could control claims made for food and drug products wherever such claims might appear would be an extension of the list of drugs that must be declared. This extension should be broad and inclusive enough to take in *all the drugs in a preparation for which curative claims* are made.

The Guarantee Clause

The observant purchaser has doubtless noticed that for the first few years of the life of the Food and Drugs Act most "patent medicines" bore on their labels "Guaranteed Under the Food and Drugs Act," and he has noticed, too, that later this disappeared as did also the legend "Serial No. ——." Many persons were led to suppose that the mere fact that a food or a medicine was labeled "Guaranteed Under the Food and Drugs Act" and bore a serial number issued by the federal government was proof that the preparation was above suspicion and had been subjected to certain tests by the federal officials. It was not. Some of the most fraudulent of "patent medicines" were "Guaranteed Under the Food and Drugs Act." The facts are that any one, responsible or irresponsible, who was in the "patent medicine" business could write to the government officials at Washington and request that his product be given a serial number and the officials had no choice but to issue such a number. Whether the product was good, bad, or indifferent; whether the drugs it contained were harmless, dangerous, or habit-forming; whether the claims made were truthful or fraudulent—none of these facts made any difference; the Department of Agriculture, willy-nilly, had to issue a serial number.

All that the serial number and the legend "Guaranteed Under the Food and Drugs Act" ever meant was that if the product on which they appeared was sold in violation of the law, the person held responsible would be the one to whom the serial number had been issued, and not the individual retailer. The confusion in the public mind regarding the meaning of the guarantee clause and the serial number was largely due to the persistent attempts of unscrupulous sellers of foods and drugs to mislead. Finally the government issued a decision declaring that no serial numbers would be given thereafter and canceling all the serial numbers that had been given. A ruling was also made prohibiting the use of any such serial number on the label or package of any food or drug.

The Powers and Limitations of the Law

The Food and Drugs Act, then, has given the public a certain measure of protection against the exploiter who does an interstate business in "patent medicines." It has made it possible for the public to know the names and amounts of eleven drugs, and their derivatives, of the hundreds that may be, and are, put into "patent medicines." It has penalized falsifying on or in the trade package so that should the seller of proprietary home remedies desire to give the public any information on or in the trade package about the origin, composition, or curative value of his remedies he must confine himself to the facts.

The law does not give any protection against the fraudulent "patent medicine" that is made and sold within the confines of any one state. It does not require the declaration of the presence or amount of scores of dangerous drugs that can be put into such remedies. It offers no protection against fraud and misrepresentation made in the common avenues

DR. KILMER'S
SWAMP-ROOT
Kidney, Liver & Bladder
CURE.
DIRECTIONS.
MAY TAKE one, two or three teaspoonfuls before or after meals and at bedtime.
Children less according to age.
May commence with small doses and increase to full dose or more, as the case would seem to require.
This great remedy cures all kidney, liver, bladder and Uric Acid troubles and disorders due to weak kidneys, such as catarrh of the bladder, gravel, rheumatism, lumbago and Bright's Disease, which is the worst form of kidney disease.
It is pleasant to take.
PREPARED ONLY BY
DR. KILMER & CO.,
BINGHAMTON, N. Y.
Sold by all Druggists.
DR. KILMER'S
SWAMP-ROOT
Kidney, Liver & Bladder
REMEDY.
DIRECTIONS.
MAY TAKE one, two or three teaspoonfuls before or after meals and at bedtime.
Children less according to age.
May commence with small doses and increase to full dose or more, as the case would seem to require.
This great remedy corrects all kidney, liver, bladder and Uric Acid troubles and disorders due to weak kidneys, such as catarrh of the bladder, gravel, rheumatism, lumbago and Bright's Disease, which is the worst form of kidney disease.
It is pleasant to take.
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REMEDY.
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MAY TAKE one, two or three teaspoonfuls before or after meals and at bedtime.
Children less according to age.
May commence with small doses and increase to full dose or more, as the case would seem to require.
This great remedy is recommended for kidney, liver, bladder and Uric Acid troubles and disorders due to weak kidneys, such as catarrh of the bladder, gravel, rheumatism, lumbago and Bright's Disease, which is the worst form of kidney disease. It is pleasant to take.
PREPARED ONLY BY
DR. KILMER & CO.,
BINGHAMTON, N. Y.
Sold by all Druggists.

"Kilmer's Swamp Root" before the Food and Drugs Act was a "Cure"; after the law went into effect it became a "Remedy." Instead of being said to "cure" all kidney, liver, and bladder troubles, it was said to "correct" such troubles. This, however, was also false and still later it was merely "recommended" for such troubles.

of publicity, such as newspaper advertisements, bill-boards, and circulars. Finally, even the powers which the law has do not suffice to protect the apathetic or careless. To get the value of its protection one must *read the labels.* Any statements regarding a "patent medicine" that can not be found on or in the trade package, should be viewed with suspicion. It is reasonable to suppose that the seller has said on the package everything in favor of his product that he can prove. Any additional claims that are found in newspaper and other advertising may be justifiably assumed to be false.

[The third article of this series, to appear in HYGEIA for June, will deal with the part played by the testimonial in the "patent medicine" industry.]

DANGER OF FLUELESS RADIANT GAS HEATERS

Serious or fatal poisoning from carbon monoxide may result from the use of flueless radiant gas heaters, even when there is not a leak in the pipe. This fact was disclosed by an investigation, by the United States Bureau of Mines, of a number of deaths due to faulty burning of gas heaters. If not enough air is mixed with the gas, combustion is incomplete, and deadly carbon monoxide is given off, whether artificial or natural gas is burned. The Bureau of Mines recommends that every gas heater have a flue; if a heater does not have a flue, a window in the room where it is burning should be kept open; that the radiants should not be permitted to glow more than three fourths of the way from bottom to top; and that in general the flow of gas be controlled by the needle valve rather than by the gas cock, since the greater the pressure of gas at the burner the less chance there is for the production of poisonous gas.

The Nature of Cancer

J. WALTER VAUGHAN

EACH year about ninety thousand persons in this country die from cancer. About one in ten of those who pass the fortieth year dies from some form of this disease. A general observance of certain rules indicated by our present knowledge of cancer would result in a marked reduction of deaths from this cause.

Certain popular beliefs concerning cancer should be discarded. From the best information now available we seem justified in saying that cancer is not contagious, not hereditary, and not a disease of the blood. Cancerous sores should be carefully dressed and kept clean, and articles soiled by the discharges should be burned because they are always contaminated by pus-producing organisms. Isolation of the patient and disinfection of the premises are not believed to be necessary. All attempts to find a bacterial or other specific infective agent causing cancer have so far failed. It is not known to be transmitted by any insect or other flying, creeping, crawling, or biting thing.

J. WALTER VAUGHAN, M.D., is a Detroit surgeon who has devoted much time to research into the nature of cancer.

The Nature of the Cells of the Body

In order to have a clear understanding of the nature of cancer, it is necessary to have in mind some well established and fundamental anatomic and physiologic facts. The human body is made up of millions of living, growing, multiplying, and dying cells. These differ more or less markedly from one another according to the work which they normally perform. A skin cell, or an epithelial cell, as it is called technically, differs from a muscle cell, and both of these differ from a liver cell and a bone cell. In health, all the cells of the body act in harmony. Each type supplies its own specific product, does not go on a strike or refuse to labor, nor does it attack its neighbors or demand more than its share of food or attempt to invade or trespass on the territory occupied by another type of cell. Since these are working cells they must be constantly wearing away, reproducing their kind, and dying. A large part of the success of their community life depends on their harmonious growth. If one cell should grow too fast and multiply too rapidly, encroachment on the rights, privileges, and even the existence, of other cells may result. The relation of cell growth to the rate of multiplication and reproduction is a matter of most delicate adjustment. There are conditions under which it is essential that the rate of cell growth in certain localities should be accentuated. This occurs when the tissue is wounded. For instance, when a finger is cut the cells in the neighborhood hasten their growth and repair the injury. Having accomplished this, the cells return to their normal rate of growth, and all goes smoothly and harmoniously as before.

Abnormal Behavior of the Cells

Under certain conditions, some of which are known while others are still unknown, a tissue cell may acquire the property of growing or multiplying too abundantly. It runs amuck, as it were. It becomes lawless and trespasses on the well established territory, right, and privileges of its neighbor. It falls on and devours not only its own kind, but also other cells. It reproduces itself so abundantly that its progeny accumulate and form a nodule or tumor. These abnormally growing cells press on and destroy their neighbors. They not only crowd out and overgrow other cells, but they even turn into cannibals and feed on their friends and allies. A cancer cell is a normal body cell which has become malignant in its growth. It has acquired a malevolent propensity for growing and multiplying. Cancer always begins as a local growth. It forms a hard lump, nodule, or tumor and, as a rule, this growth is accomplished without pain. This is because even the cancer cell, with its acquired propensity for growth at the expense of other cells, multiplies slowly.

Need of Early Operation for Cancer

If a cancerous tumor is removed while it is still local, the cure is likely to be complete. If neglected, the cancer cells force their way to the surface, and the hard lump becomes an open discharging sore; in this destructive process the cancer cells are aided by pus germs which find their way from without. The cancer cells not only force their way to the surface; they may break through the walls of the blood or lymph vessels, especially the latter, and are thus distributed to distant glands where they continue their abnormal growth. Operation postponed until this stage is reached must be more extensive, and it is difficult and

uncertain in its results. The cancerous nodule that forms on the breast is at first wholly localized. Removal at this time, if it includes all the abnormally growing cells, effects a cure; but if removal is neglected, some of the abnormally growing cells find their way to the glands in the armpits. Then the surgeon must remove not only the breast but also the infected glands in the armpits, and the chance that he will be able to cut out all the lawless cells is much reduced.

When operation is performed for cancerous growths that are confined to the breast, recovery follows in about 80 per cent. of cases; when operation is delayed until lymph glands are involved, recovery follows in less than 20 per cent. By recovery, I mean that five years after the operation there has been no recurrence.

In the normal condition of health, if a cell belonging to a given organ or tissue accidentally finds its way into other territory it dies. Not so with a cancer cell. It is able to establish itself in the place to which it has been transported, and there it continues to grow and multiply, interrupting the function of the organ in which it finds itself. This may be in the lung, the liver, or other internal tissue beyond the possibility of being reached by the surgeon's knife.

Irritation a Predisposing Factor in Cancer

Although we do not know the agent in all instances which converts a normal body cell into a cancer cell, we are certain that repeated and prolonged irritation may convert a normal cell into a cancer cell.

More than 90 per cent. of the cases of cancer of the lip and tongue occur in males. This is believed to be due to the fact that men subject their mouths to more constant irritation than do women. Chief among these causes of irritation is smoking. It is believed that the active agent in this conversion is not some constituent of tobacco smoke, but the result of the irritation caused by the heat of the pipe stem. Cancer of the lip and tongue occurs most frequently among men who use short stem pipes, especially clay pipes. Fortunately this form of smoking is growing less common.

In India, many men and women of certain classes chew betel nuts, which greatly irritate the mucous membrane of the mouth. Among the addicts to this habit, cancer is common.

Another cause of cancer of the mouth is the constant injury to the parts by the presence of jagged, sharp tooth edges. These inflict an injury every time the mouth is opened and closed, which may be many hundreds of times each day. Ill fitting plates are possible causes of cancer. Careful and constant attention to the hygiene of the mouth will do much to prevent cancer in this region.

Further evidence that cancer may result from frequent irritation is supplied by the people of Kashmir, where it is a habit in the cold season to suspend from the neck a small metallic stove filled with smouldering charcoal. Cancer frequently develops where the warm stove comes in contact with the skin. Formerly it was the practice in London to employ boys to clean chimney flues. In doing so these boys came in contact with hot bricks and were besmirched constantly with soot. Cancer was frequent among the chimney sweeps.

It must be admitted that there are many cases of cancer in which constant irritation cannot be accounted as the cause. Hundreds of research workers are constantly seeking additional information concerning the nature of cancer, and year by year some small contribution to our knowledge is made.

Treatment by X-Ray

We are often asked if surgical intervention is the only means by which cancer can be treated successfully. Any other procedure must be dependent on the employment of some agent which will destroy the cancer cell, and at the same time not injure the normal cells. Some superficial cancers can be cured by the application of the emanations from radium. The value of the x-ray in the treatment of malignant growths is a subject under constant study. Improvements in this form of treatment during recent years give hope for much better results but, as yet, it is too early to judge.

When to Consult a Physician

Sometimes the primary cancer is in some internal organ, such as the stomach. When blood, even in traces only, is found in vomited matter or in the stools, especially when such occurrence is repeated, a physician should be consulted. Ten to one, the cause is found not to be cancer, but whatever it is, it should be determined.

When a sore on any part of the body, especially near some orifice, does not heal properly, go to your physician. Any hard lumpy growth, however small, cannot be ignored safely and needs close attention and expert examination.

Do not think that every canker sore in your mouth or crack on your lip is a cancer, but if a sore there or elsewhere persists, becomes hard, and is not painful, go to your physician. "Safety first" is as suitable a slogan in the prevention of cancer as it is in the avoidance of accidents.

First Aid to Medical Terms

WATSON DAVIS

DISEASES of man have changed but little with time. If a paleopathologist is allowed to examine the mummy of King Tut-Ankh-Amen he probably will be able to tell us what physical trouble ended that ancient royal career. Whatever it was that ailed King Tut, if he died a natural death, it is a good guess that the student of ancient diseases will be able to give it a name that would have startled the King as much as a prophetic vision of a gasoline camel on caterpillar treads traveling the Sahara.

Diseases and their treatments antedate antiquity, but we are now only beginning really to know them intimately and call them names. Medicine is dynamic. Those who believe it static in nomenclature should try to do a little translating from the technical to the vernacular of the street. Many of the words are not in the medical dictionaries that are just off the press. Yet medical men are probably more lucid in naming their discoveries, inventions, and differentiations than the man who labels Pullman cars, streets, and automobiles, or even the millions of fond fathers and mothers who must give their babies fitting forenames. New preparations for combating disease, newly recognized functions, and distinct phases of disease are usually christened logically from an historical standpoint.

Mr. Davis here gives the story of the name diabetes and of the latest preparation which has been developed in the effort to find something that will check the course of this disease.

"Insulin" is a new word that has penetrated into the medical press and then into the newspapers in the last few months. Without judgment on the hopeful future, it is inspiring to know that this recently christened medical weapon is beginning to be used in the treatment of a disease that was named during the second or third century after Christ, described by Celsus himself, and which had, no doubt, endured for many centuries before.

A literal translation of diabetes is "through to pass," and it is believed that the disease got its name from the Greek word signifying syphon. If this disease were being named today it is conceivable that it would still be "diabetes," for the "passing through" describes in part the disturbance. Aretaeus, a Greek medical author, called diabetes a wonderful affection "melting down the flesh and limbs into urine," and his description is correct figuratively today, for diabetes in most cases is characterized by a passing through the body of excessive quantities of water. In the most common form of this disease, the sugar eaten or made in the body from starchy food is not utilized from the blood stream and is lost by passing out dissolved in the excessive amount of water. When this loss of energy-containing sugar occurs, diabetes is qualified by the word "mellitus" which comes from the Latin word for honey. Sugar in the urine is not always a sign of diabetes mellitus, for often diet, severe nervous strain, or fever causes a simple overflow of sugar. Such a condition is called "glycosuria," which is the medical way of saying "sugar in the urine." While the term glycosuria is used in referring to one effect of diabetes mellitus, it must be remembered that all cases of glycosuria are not diabetes. Nor is there an excess of sugar in all cases of diabetes, for another type, diabetes insipidus, derives its qualifying name from the fact that the water passed is not sweet but insipid.

For many years it has been known that the pancreas has something to do with the ability of the body to use sugar, the most concentrated form of food for energy. When the pancreas was removed, diabetes resulted. Then the problem was narrowed down until it was shown that the essential factor in diabetes is a disturbance of the internal secretions of the portion of the pancreas known as the islands of Langerhans. Though the pancreas is "all flesh" in the sense that it contains no bone, the etymology of the word disregards this chemical messenger or hormone that "excites" (just as the derivation of the word requires) the sugar-using tissues into a state of active and normal consumption. The normal person need not worry about these chemical messengers. They do their work automatically when we do not think or know about them.

To the sufferers hormones mean life or death, and if they cannot make them in their own bodies they must get them from the laboratory. The scientists at Toronto have succeeded in isolating from the pancreatic glands of animals and fishes an extract that seems capable of replacing the hormone that the human body creates. Very properly they christened this new preparation "insulin," from *insula*, the Latin for island, because the extract is obtained from the part of the pancreas known as the islands of Langerhans.

Plain Facts About Health and Disease

HEALTH NEWS OF THE MONTH

Ethylene, a New Anesthetic

In 1918, Dr. Arno B. Luckhardt and Dr. J. B. Carter of the department of physiology in the University of Chicago began experimenting with the gas ethylene for use as a general anesthetic. Nitrous oxide, or laughing gas, may be used successfully for short and light anesthesia, but given deep or for long periods, the effects must be carefully controlled. From results just announced it appears that a proper mixture of ethylene and oxygen permits a deep anesthesia without much danger of congestion and that recovery following its administration is rapid. Thus far, the method has been applied in only a few human cases. The preliminary experiments indicate that the discovery may eventually have wide applicability for use in surgical and obstetric cases.

A Test for Tuberculosis

During the past month many newspapers reported a discovery, said to have been made by Wassermann, which would revolutionize the treatment of tuberculosis. From the data thus far available it is impossible to make definite statements regarding the matter, but a careful reading fails to reveal any basis for the belief that the discovery could have such far reaching effects. Wassermann achieved medical immortality through the discovery of a test which permits early and accurate diagnosis of syphilis. The announcement now made indicates the discovery of a similar test —a so-called complement-fixation test, performed on the blood—for tuberculosis. Ever since the discoveries which led to the development of the method for diagnosing syphilis by Bordet and Wassermann—usually known as the Wassermann test—scientific investigators have been using a similar method in various diseases. It is, of course, highly desirable to have accurate methods of early diagnosis of disease. The blood test described has already been applied in many thousands of cases of tuberculosis, but thus far the results have not been sufficiently accurate to warrant accepting a positive response as definite evidence of the existence of the disease. If Wassermann has been successful in developing a method for the diagnosis of tuberculosis which will be as nearly accurate as the method applied to syphilis, he will have aided greatly early diagnosis in this disease. The chief value of the method will be earlier treatment. It is known that early treatment means success, whereas late treatment frequently results in failure. As to methods of treatment, the test will have little effect. Fresh air, good food, adequate sunlight, and a careful regime of life are still the mainstays of successful combat against tuberculosis.

Epidemic Encephalitis

In various parts of the United States epidemic encephalitis, known variously as "sleeping sickness" or "sleeping flu," has again appeared and aroused medical interest. From the spring of 1920 until recent months there had been comparatively few new cases. The causative agent of the disease—probably a germ or virus—has not yet been discovered. The disease seems to bear some relationship to outbreaks of influenza, but the exact character of this relationship has not been worked out. During the last few years physicians have had extensive experience with the disease and are recording knowledge regarding the symptoms and the effects of treatment which will be of great value in its control. One of the most interesting points is that not all patients are drowsy, but that many are, in fact, excitable, overstimulated, and easily aroused. In such cases it becomes especially important to distinguish between epidemic encephalitis and various unusual mental disturbances.

Transplanting an Eye

The press has recently reported an attempt to transplant an eye from a pig to a human being. There is not the slightest evidence that such a transplantation has ever been successful. Knowing what we do of the human eye it is safe to say that it never will be successful. An investigation shows that an attempt was made to transplant merely the cornea, that is, the front tissues, of the eye of the pig to the human eye, and that this does not, even remotely, resemble a success.

M. F.

FAMINE AND PESTILENCE IN RUSSIA

THE newspapers and Nansen, the Arctic explorer, have kept us fairly well informed concerning the ravages of famine and pestilence in Russia. We have before us the report made by Dr. Tarassevitch of Moscow to the Health Committee of the League of Nations. This gives us a more detailed statement concerning the horrors caused by disease and starvation throughout the territory formerly embraced in the great empire. This report shows that famine, especially to the east of the Volga, has stricken many millions of people, and that cannibalism actually has been practiced. Dr. Tarassevitch says:

> Almost all the horrors experienced east of the Volga have already made their appearance; use of dead bodies for food, cannibalism, and death everywhere; some die at home, in a kind of indifference and torpór; others fly in an attempt to escape and perish on the way. The reports presented at the last meeting of the Medico-Psychological Society by the alienists who had come from Saratov, Samara, and the south showed on good evidence that all the horrors mentioned above are rampant. One proof will be sufficient: at Samara the entire lunatic asylum has been given over to eaters of dead bodies and cannibals.

Asiatic cholera has become endemic, and the number of cases has reached 5,500,000, with 2,200,000 deaths, giving an average case mortality rate of 40 per cent.

Bubonic plague appeared in Manchuria about the end of 1920, and continues in localities in Turkestan and adjacent provinces, although it has not as yet established itself in European Russia.

Cases of typhoid fever and dysentery have multiplied by about four since 1918. In 1921 the two diseases killed about half a million.

Malaria has not only spread until for the first time in the history of the world it has reached the arctic circle, but also on account of the scarcity of quinine it has acquired a virulence hitherto unknown except in the tropics.

There have always been many cases of scurvy in Russia. During the last years there has been a marked recrudescence of this disease, especially in the Ukraine, where in 1920 and 1921 nearly 75,000 cases were reported for each year.

The most disastrous diseases prevalent in Russia now are typhus and relapsing fever. The victims of these diseases number millions.

It is impossible to give anything like an exact estimate of the prevalence and increase in tuberculosis. Many persons afflicted with this disease die from famine or more acute infections. In 1920, an attempt was made to establish sanitariums for tuberculous patients, but the extension of famine and the economic crisis have put an end to all these efforts. It is stated that in some localities in Russia syphilis is so widely prevalent that it has become an extragenital disease. This means that it spreads through a family by ordinary contact. Ravages from venereal diseases have become greater on account of failure to secure specific treatment. Estimates of their prevalence in some localities vary between 10 and 50 per cent. of the entire population. Dr. Tarassevitch says:

> While it is very difficult even under normal and ordinary conditions to carry on an efficient campaign against syphilis and venereal disease, it becomes quite impossible in times of such far-reaching social upheavals, and this is a very distressing factor which is likely to affect the future of the race.

From a scientific standpoint it is very interesting to know that, according to Dr. Tarassevitch, diseases ordinarily regarded as noninfectious have taken on the characteristics of epidemics. Among these are ulceration of the stomach and intestines and abortion. Suicide has also become prevalent. A census was taken in 1920. The area involved in this census had a population before the war of about 102,793,000. The census shows that in 1920 this population was decreased by 12,084,000. In other words, the total loss amounted to about 12 per cent. Fortunately, the birth rate decreased and is estimated for 1920 as about twenty-five to the thousand, while the death rate for the same time was about thirty-eight to the thousand.

In the beginning of the Russian revolution physicians, among many other educated people, were put to death. It is estimated that about 8,000 physicians were executed. With all these horrors it is interesting and encouraging to know that the physicians in Russia today are doing the best they can to check the spread of disease. Dr. Tarassevitch says that "the misfortune which afflicts us will not lead into despair and inaction. . . . Though the situation may be and sometimes is desperate for isolated individuals, it cannot be so for an entire nation still young and populous, living in an area as immense and as rich in natural resources as Russia."

The Russian poet Nekrassoff writes:

> The Russian people has endured much;
> It will endure all that God may send it;
> It will press forward a broad clear path.
> Alas, both you and I will be dead on that glorious day.

V. C. V.

THE LIMITATIONS OF MEDICAL SCIENCE

SCIENTIFIC medicine loses nothing when its followers admit, as they often do, that their present knowledge of the human body and its processes still falls far short of what they wish. It has been suggested that if the physician admits that the number of drugs that are really specific in the treatment of disease is limited and that, in the majority of cases, nature accomplishes the cure—with some help from the physician—the public will lose confidence in scientific medicine. We do not believe it. The intelligent part of the public is perfectly cognizant of the limitations of experts in all lines. There is nothing sacred about modern medicine or about any other branch of modern science, except the sacredness of truth. There is nothing mysterious about it, although the subject is infinitely complex and there is a tremendous amount yet to learn. Mystery and secrecy can be left to the quack and the "patent medicine" vender. The honest physician admits the limitations of his science and his art. Yet when all the admissions possible have been made, modern scientific medicine offers more to the human race in the prevention and cure of disease than do all the cults, 'pathies, 'isms, and fads in existence. And deep down in its heart the public knows it.

A. J. C.

TYPHOID FEVER IN 1922

THE *Journal of the American Medical Association* for March 10 contains its annual summary of deaths from typhoid fever in the large cities of the United States. This summary for 1922, the eleventh in the series, shows a continuance of the steady decline in the presence of typhoid in our communities which has been going on for the last twelve years. During 1922, the extremely low rate of 3.15 for every hundred thousand inhabitants was reached.

Three cities with an aggregate population of 473,975 were able to report that not a single death from typhoid fever had occurred within their confines during the past year. This unusual honor is credited to Providence, Rhode Island, New Bedford, Massachusetts, and Yonkers, New York. Six of the largest cities in the United States had a rate of less than 3. The most complete typhoid records are published by the New York City Health Department, which carefully traced the method of infection in 42 per cent. of the cases in that city. Of the persons infected 26 per cent. received their infection outside the city. Bathing in polluted water caused twenty-four cases, and eating contaminated shell fish caused six cases. A number of the cases were traced to contaminated ice cream eaten at a Thanksgiving party, and it was supposed that the wife of the proprietor of the ice cream store was a typhoid carrier. A careful investigation in Philadelphia showed an almost parallel list of causes.

The highest typhoid rate for any northern city is that of Trenton, New Jersey, and it is closely followed by Reading, Pennsylvania. These towns have rates of 15.9 and 9.2 as compared with rates of 1.4 and 2.1 for Scranton, Pennsylvania, and Paterson, New Jersey, which are very close to them. Is there any good reason for such a wide difference in the rates? Is there not, instead, a good indication that Trenton and Reading might profit by an antityphoid campaign?

It seems evident, from the summary, that not much further reduction in the death rate from typhoid in cities can be expected until the rates in rural districts are still further reduced. Furthermore, the rates in the south, which are in general higher than those in the north, will probably not diminish greatly until the difference between the incidence of the disease among the colored population and the incidence among the white population is controlled. The most encouraging feature of the situation is that our large cities are no longer black plague spots, distributing typhoid and radiating corruption into the surrounding country-sides. The two great agencies of typhoid dissemination, polluted water and raw milk, have been eliminated. The cities of the United States may well be proud of the present result of their campaigns against this disease.

M. F.

THE ESCANABA FEVER CASE

THE performance of the young woman of Escanaba, Michigan, who, for twenty-one days, succeeded in convincing the physicians of her community that her temperature ranged up to 120 F., aroused tremendous public interest. When her simulation of disease, scientifically termed "malingering," was finally exposed through the application of rigid controls over the methods of observation, the public was swayed between two aspects of the matter. It did not know whether to admire the cleverness of the young woman or to wonder at the apparent blundering of her physicians. Certainly the newspaper writers and the public need bear no share of what-

ever blame may attach to any one for the perpetration of the hoax. Public knowledge of the possible range of performance in human functions, normal and abnormal, is lamentably slight, and it is one of the purposes of HYGEIA to bring to public attention the facts in regard to these matters.

Previous to 1900, scientific knowledge of the mechanism by which body heat is produced and regulated was not so definite as it is today. Moreover, less was known of the chemistry and physics of the body tissues. If the medical records of that period are consulted, reports of many cases can be found in which highly unusual temperatures are recorded. In fact, at a meeting in 1895 of one of the most important medical organizations of the country, two great medical leaders vouched for observations of temperatures of 148 F. and 171 F., respectively. With the advance of our knowledge, however, it has become fairly certain that the body tissues cannot long withstand a temperature approximating 110 F., or even 108 F. Indeed, only eight or ten instances of survival after the temperature has reached these figures, even momentarily, have been recorded. It is known that high fevers entail a great stress on the tissues of the body, and that the destruction of tissues proceeds at a rapid rate. It would, therefore, be impossible for the tissues of the body to sustain such high temperatures as it was generally reported those of the Escanaba girl were sustaining. The public has been fully informed as to the trick by which she succeeded in producing such high thermometric readings: the concealment of a small hot water bottle, which was regularly touched to the thermometer.

M. F.

ON FOOLING THE DOCTOR

HIGHLY philosophical questions as to the reasons for malingering, for suicide, or for homicide, have long agitated not only the scientists, but also the legal and theological talent of the world. The motives are usually the age old passions: love, hate, envy, ambition, sorrow, the desire for sympathy, or laziness, or the wish to evade an unpleasant situation. Several years ago a popular song of the vaudeville stage was entitled, "Doctor, doctor, I don't want to get well." In the popular songs of the public one finds current psychology. The words of the song mentioned expressed the views of a patient who found himself comfortably situated in a warm hospital room, attended by a nurse of unusual pulchritude, and receiving regular visits of condolence by regiments of sympathetic friends. It was obviously to his interest to maintain the status quo as long as possible. Failing the continuance of the symptoms for which he was first taken to the hospital, he might, conceivably, endeavor to simulate the symptoms.

Patients who try to fool their physicians are not uncommon. There is the patient who claims to suffer regularly with headaches. How is the physician to know whether or not the patient actually has a headache? If the malingerer is careless enough to mention some of the senses or sensations that are easily determinable, the careful physician may soon bring the malingering to light. In one instance a man, desiring to evade military service, claimed defective vision. He was given the usual examination and the physicians were convinced that his vision was extremely poor. Then, as the man was dressing himself after the examination, he accidentally dropped a black safety pin on the dark floor and picked it up without the slightest hesitation. In another instance a man who claimed deafness had failed to respond to any of the usual tests. As he started to leave the room someone said in an ordinary tone of voice, "You forgot your purse." He turned immediately. Of such are the ways of malingerers! Many times, however, the matter is far more complicated. Imagine, for example, someone who is thoroughly conversant with the methods of the physician and with medical science simulating loss of memory, or loss of motion or sensation in some portion of the body. The discovery would tax the ingenuity of the cleverest medical detective.

After all, the determination as to whether or not a person is simulating a physical or mental disturbance depends on two main factors: the knowledge of the physician concerning the condition simulated compared with the knowledge of the malingerer, and the trust of the physician in the person to be examined. The greatest masters of medical science have always besought their disciples to be skeptical rather than credulous. William Harvey, discoverer of the circulation of the blood, said, "I am of the opinion that our first duty is to inquire whether a thing be or be not before asking wherefore it is." And Bovee wrote, "The more gross the fraud, the more glibly will it go down, and the more greedily will it be swallowed, since folly will always find faith wherever impostors will find impudence." The "will-to-believe" seems much stronger than the "will-to-doubt."

After all, the patient who tries to fool his physician is only fooling himself. Almost inevitably the deception is exposed and then comes the doubly severe reaction of a cold and unsympathetic world. At such times it may be well to remember that although the physical illnesses claimed may not exist, there is probably some mental disturbance for which the patient requires even more skilful treatment.

M. F.

DO THE INFECTIOUS DISEASES ELIMINATE THE UNFIT?

THERE is a popular belief that the infectious diseases, especially those of infancy and childhood, kill off the weaklings and thus in the long run improve the race by the elimination of the less fit. This is not only a popular and wide-spread belief; it has received the sanction and support of some eminent men. Even Herbert Spencer, the philosopher of modern science, held that the medical profession by protecting infancy and childhood against the ravages of such diseases as measles, scarlet fever, and diphtheria, was accumulating large numbers of the unfit much to the detriment of future generations. This is a matter which deserves scientific inquiry.

When the commission appointed to study typhoid fever in our army camps in 1898 began its study, the men composing it believed that they would find that the soldiers under par in health and generally less vigorous would acquire the disease more readily than the robust, and that the death rate among the former would be higher than among the latter. For the purpose of gathering statistics to uphold this preconceived idea, the members of the commission made a detailed study of the history of nearly five thousand men who had typhoid fever in the camps at that time. The commission expected that their figures would show typhoid fever more common and more fatal among the less robust and the less vigorous. After making their studies and assembling their figures they found that the results were just the opposite. In the first place, typhoid fever was more prevalent among the strong and vigorous than among those less robust. This was easily understood when it was recognized that the men more vigorous and robust, never on sick report, were those who were sent on all kinds of special duties. They were the men who served as scouts, who made forced marches, who patrolled exposed areas. In other words, they were the ones whose range of activities was the widest and consequently were more frequently exposed to infection. They drank water from all sources. They obtained milk and possibly other food from clean and from unclean homes, while the less robust were detained in camp on light diet and were drinking only sterilized water and eating only well cooked food. It has long been known that typhoid is more prevalent among men than among women, and more prevalent among young adult men than either among children or men in mature life. It is now known that this greater frequency of typhoid fever among adults is due to the wider range of activity at that time of life and more frequent exposure to infection. However, what most surprised the commission on typhoid was the finding that of those who had typhoid fever the more robust and more vigorous were more liable to die. In other words, they showed the highest death rate. On looking back over the history of other diseases it was found that this holds good in many epidemics. In the epidemics of typhus fever in Ireland two centuries ago, of every twenty-three of the poor underfed natives who developed typhus fever one died, while among the doctors, priests, and nurses, who were better fed and more robust, one of every three who contracted the disease died from it. An English writer of that time, observing an epidemic of typhus fever in his neighborhood, says that it went through the community even as you or I would go through a flock of sheep, picking out the healthiest and the lustiest. When Pasteur began to apply his vaccines in the prevention of anthrax among the cattle and sheep of France, close tab was kept on the progress of this disease among the flocks, and it is a matter of record that this disease killed off the strong and vigorous animals in larger proportion than it did the less perfect. In other words, statistics positively show that epidemic diseases, like war, kill in greater numbers those physically most fit. When a strong young man becomes infected with a virulent microbe the body cells enter vigorously into the contest and the patient recovers quickly or dies speedily because nature overdoes its work. The invading bacteria are destroyed too rapidly and the poisons resulting from their destruction overwhelm the body.

The careless consumptive deposits his bacteria-laden sputum on the sidewalk, where it dries and is scattered through the air. The passer-by at the opportune moment is liable to become infected whether he is fit or unfit to live. The milkman distributes milk con-

taining the micro-organism of scarlet fever or typhoid fever. Will only the unfit among the family to which the food is distributed acquire the disease?

V. C. V.

WHY LET THE UMBRELLA MENDER FIX YOUR WATCH?

THE human body is a mechanism far more complicated than any piece of machinery ever conceived or constructed by man. Not only is it more intricate in the absolute chemistry and physics of its construction, but it has added features not possessed by any mechanical apparatus: life, growth, and degeneration. Nevertheless, some human beings, presumably of average if not of more than average intelligence, when confronted with definite signs of interference with the proper operation of the human machine, seek out, instead of an adviser who has spent years in acquiring some knowledge of the makeup and operation of the machine, a tinker who has hardly served a beginning apprenticeship in the subject, who has no conception of the way in which the parts are constructed, who does not realize their mutual interdependence, who may trifle with the machine to its ultimate destruction. This is not a plea for the physician; it is a plea for a minimum standard of education for those who propose to diagnose disease and to treat the sick. You would not let an umbrella mender fix your seventeen jewel watch! Who is tinkering with your body machinery?

M. F.

DUTCHMAN'S BREECHES AND SQUIRREL CORN ARE POISONOUS

ALMOST every country child in the east and south of the United States is familiar with the little plants called Dutchman's breeches (*Bikukulla cucularia*) and squirrel corn (*B. canadensis*), and most children have observed the resemblance in shape between their flowers and that of the "bleeding hearts" of their grandmothers' gardens. In some localities these plants, which belong to the poppy family, are called "stagger weeds" from the symptoms exhibited by domestic animals supposed to have been poisoned by them. They bloom in the early spring, and have long been suspected of poisoning cattle in the early season before forage becomes abundant. Persons are not known to have been poisoned by them. The report of an examination of these plants was published recently in the *Journal of Agricultural Research* (1923, xxiii, 69-78). The studies were made by officials in the Bureau of Plant Industry of the United States Department of Agriculture in collaboration with the Virginia Agricultural Experiment station. It was found that both plants contain poisonous substances (alkaloids) in the tops as well as in the bulbs. One of the alkaloids isolated, which has been named cucalarine, is exceepingly poisonous to mice; when it is injected beneath the skin, the animal dies in convulsions after a period of intense excitement. The Dutchman's breeches is much more poisonous than the squirrel corn, a fortunate circumstance since the bulbs of the latter are more conspicuous and would probably be more attractive to small children. Persons in localities where these plants abound should keep them in mind as possible sources of danger to children.

L. E. W.

CONSIDER THE RABBIT'S FOOT

AMONG the illiterate, in certain parts of the country, there is a firm belief in the value of the rabbit's foot as a preventive or cure of disease and as a bringer of good luck. It must be the left hind foot of a rabbit that has been caught in a churchyard during the dark of the moon. Probably the number of people in the United States who believe in the efficacy of a rabbit's foot is small. But suppose that some one concern had an exclusive proprietary right to the sale of rabbits' feet and that the feet could be purchased only from this company; suppose, further, that the company carried on an extensive and intensive advertising campaign setting forth the marvelous therapeutic efficiency of the pedal extremities of *Lepus sylvaticus;* suppose that articles appeared here and there in the newspapers telling of the success that had attended the use of the rabbit's foot in the treatment of certain ailments; suppose that signed testimonials were published recording the alleged recoveries from various chronic ailments following the use of this marvelous curative agent. What then! It is by no means unthinkable that under such conditions many people of intelligence would be found ready to declare that the rabbit's foot has curative powers and that the physician who pooh-poohs the idea is actuated only by professional jealousy. Fortunately, there can be no monopoly on rabbit's feet. Any one can sell them. Therefore it does not pay to spend money on an advertising campaign extolling their curative value. And this, possibly, is the only reason that has prevented the humble cottontail from becoming a therapeutic hero.

A. J. C.

HEALTH NEWS AND VIEWS

CLINICS FOR BALTIMORE CHILDREN

The Robert Garrett Hospital for Children has been turned over to Baltimore and Dr. William S. Bear for child welfare work by Mrs. Henry Barton Jacobs. The hospital will house six free clinics for tuberculosis, teeth, eye and ear, nose and throat, child welfare, and antidiphtheria treatment, to be established by Dr. C. Hampton Jones, commissioner of health, and beds for deformed children to be examined and treated by Dr. Baer. Mrs. Jacobs will maintain the hospital; the health department of the city will supply funds for three physicians. The clinic will be opened May 1.

THE AMERICAN CHILD HEALTH ASSOCIATION

The American Child Hygiene Association and the Child Health Organization of America have combined and will now be known as the American Child Health Association. This organization is under the leadership of Mr. Herbert Hoover and it is to have the support of the American Relief Administration. The American Child Hygiene Association has been striving to improve conditions for the mother before and after childbirth, for the infant, and for the child up to five years of age. It has done splendid work. The Child Health Organization of America, under the presidency of Dr. L. E. Holt of New York, has been endeavoring to teach hygiene in such a way as to engage the active interest of each boy and girl in America. The remarkably successful work of both of these organizations is now being broadened greatly. The American Relief Association will utilize its experience in Belgium during the World War and in eastern and central Europe since the war. The American Child Health Association will cover the whole cycle of life before the child enters the industrial world or college. Such a work cannot be effected without the fullest cooperation of the local welfare agencies already functioning. It needs the active assistance of every parent, doctor, nurse, teacher, public health official, and association in the world. The aim of the new association is to create what may be described paradoxically as a decentralized children's union, which means that it wants every agency and every individual a member of the national body, but it does not purpose to usurp or even direct local activities. On the contrary, its object will be to stimulate, when necessary, and to further in every way possible the work now being done in local communities. The American Child Health Association will act as a clearing-house of information on all national child activities; will serve as a source of up-to-date, scientific information on child health; will supply a field service composed of experts who, on request of a community, will help organize a new local health body or help solve the problems of one already organized; and will seek to establish standards for child health work on a sound medical basis, to eliminate waste in the practical application of these standards, and to coordinate the work already being done in such a way as to avoid all duplication of effort.

EMPLOYEES' COMFORTS

Attractive rest rooms have been accepted in industry as a means of keeping good health for employees and giving better production for employers. This is a view of the rest room of the Dennison Manufacturing Company, in Framingham, Massachusetts.

LIST OF HEALTH EDUCATIONAL FILMS

The National Health Council has prepared and published a list of educational motion pictures on health subjects. More than 300 titles are included in the list. The number of reels or the length, the name of the distributor, the rental or sale price, or both, and a brief note about the subject matter of the picture are added. The titles are classified under Child Hygiene, Personal Hygiene, Public Hygiene, Communicable Diseases, Other Diseases, Nursing, Anatomy and Physiology, Miscellaneous, and so forth. This list of films will be sent to any person or organization interested in health subjects, but it is intended primarily for public health workers connected with official and voluntary agencies. The list is priced at thirty-five cents a copy, in order partly to pay for the expense of its preparation.

A study of all films now being shown is being made by the National Health Council, through the Health Films Committee, in the attempt to encourage the making and producing of better films. Six motion pictures have already been studied and reviewed by the committee, and suggestions made for their improvement.

The published list and other information may be secured from the National Health Council, 370 Seventh Avenue, New York.

CHICAGO ASSOCIATION FOR THE PREVENTION AND RELIEF OF HEART DISEASE

Offices of this association have been established at 17 North State Street. An executive secretary, Miss Amy Hamburger, has charge of carrying on the work of the society. In a preliminary announcement it is pointed out that heart disease is a greater menace than either tuberculosis or cancer; that the period of incapacity from heart disease is longer than that from either of these diseases; and that it is a problem which affects one industrial worker in every fifty. It is proposed to aid in prevention through popular instruction, the supplying of proper medical advice, and the selection of proper employment. Seven clinics have already been established in leading medical institutions in Chicago. Membership in the society is open to the public in three classes: annual, sustaining, and contributing.

International

ORIENTAL YOUNGSTERS IN BABY SHOW

The baby show is distinctly a western innovation, but the wise oriental mothers have not been slow to see its advantages. At a recent demonstration in New York City this group patiently waited in turn to receive the benefits of scientific supervision of their children's health.

Fotograms

AVERTING THE EXPLOSION

Here a Washington, D. C., fireman abruptly removes a cigaret from the mouth of a careless garage attendant who is gazing into the pearly gates and evidently doesn't know it. A common cause of fire and injury is the smoking of cigars and cigarets near gas, oil, and motor vehicles.

VACCINATION FOR FEDERAL EMPLOYEES

Postmaster General Work, before becoming secretary of the interior, arranged for vaccination against smallpox and typhoid for all of the 333,000 employees of the post office department who cared to avail themselves of scientific protection against these diseases. Among the first to do so was Assistant Postmaster General H. H. Billany.

Wide World

Underwood

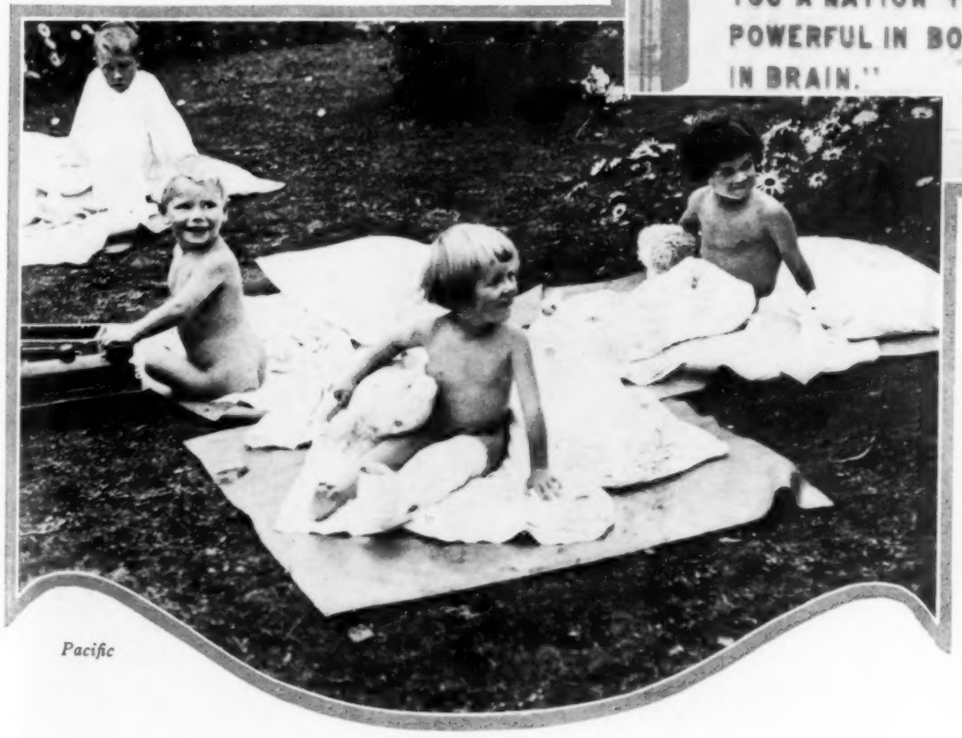
SCHICK DOES THE SCHICK TEST

Dr. Bela Schick is here shown applying his test for diphtheria to school children in New York City. Two drops of the solution is injected into the skin of the forearm. If the child can contract diphtheria, a small red spot, about the size of a five cent piece, appears within forty-eight hours; if the child cannot contract the disease—is immune to it—except in rare instances, the skin remains unchanged. Dr. Schick has come from Vienna to tell American physicians of his work.

A HEALTH MESSAGE FROM THE COW

This exhibit was a part of a health show recently held in New York. The message of the cow is made attractive to children by such devices as these figures.

Fotograms



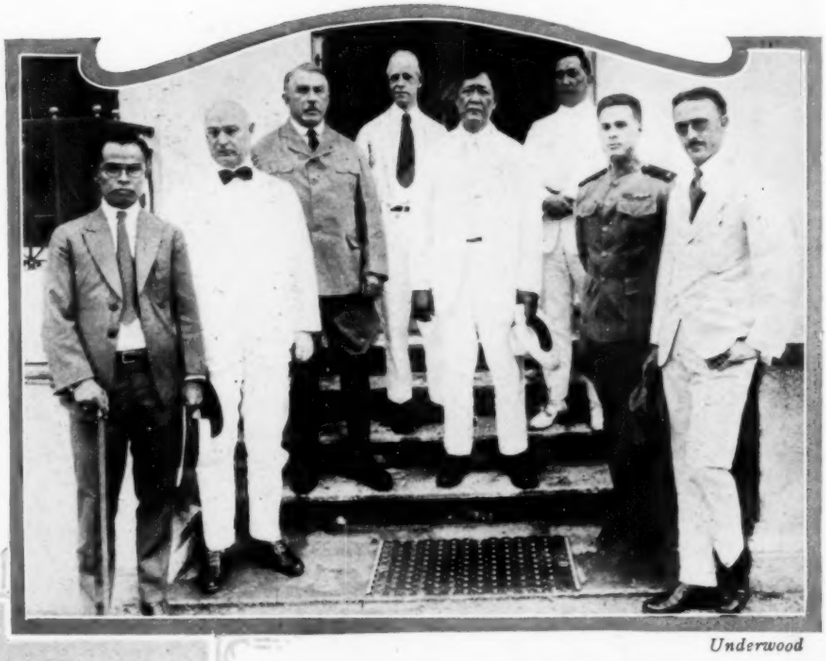
Pacific

SUNNING FOR HEALTH

Children with tuberculous joints improve in the sunlight. At the National Orthopedic Hospital in England there is a large garden in which the crippled children receive the advantages of sun and flowers at 450 feet above sea level.

PHILIPPINE ANTI-LEPROSY SOCIETY TRUSTEES VISIT LEPER COLONY

In this picture is shown the Board of Trustees of the Philippine Anti-Leprosy Society which recently visited the Culion Leper Colony of 5,000 sufferers. Reading from left to right are Camella Osias, president of the National University of the Philippines; William T. Nolting, president of the National Bank of the Philippine Islands; Governor General Leonard Wood; Professor Shirley E. Roberts, founder of the society; Teodoro Yangco, first Filipino resident commissioner at Washington; Ramon Fernandez, mayor of Manila; Señor Basilion Valdes, only Filipino to be decorated in the recent war, and J. E. Marias, United States Shipping Board representative in the Philippines.



Underwood

International

CARNEGIE MEDAL FOR FRENCH PHYSICIAN

In the early days in the development of the x-ray, many physicians were injured, because at that time it was not known that protection against the rays was necessary. Dr. Charles Vaillant, who lost both arms in conducting experiments, was recently decorated with the Carnegie Medal by Ambassador Herrick, United States representative to France. In the photograph, reading from left to right, are M. Aucoe, president of the Paris Municipal Council; Dr. Vaillant, wearing the badge of the Legion of Honor, and Ambassador Herrick. At the right is Mme. Vaillant.

International

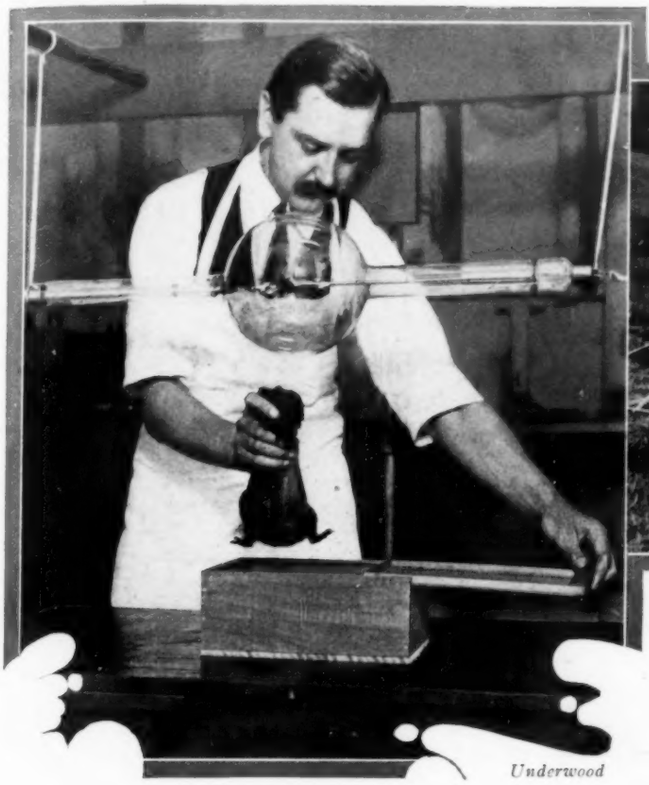
MEDALS FOR MOTORS

The Telephone Company of Cincinnati confers a medal on each car that goes through the year without an accident. As soon as a car has an accident it loses its badge.

EXERCISING FOR HEALTH

The young women at the Post Graduate Hospital and Clinic in New York City are utilizing muscular exercises to build vitality. Invalids with intestinal disorders use exercises adapted to their condition.

Underwood



Underwood

TWO HUNDRED THOUSAND VOLTAGE ROENTGEN RAY TUBE USED IN TREATMENT OF CANCER

This roentgen-ray tube was recently installed in a hospital connected with an eastern university. The tube is used in the modern treatment of cancer. The method offers hope of additional control over cancer, especially when the condition is recognized early in its course. Not only are cancers treated by this method alone, but also the tissues following surgical removal of growths. Extensive experience is beginning to show its value and its limitations. The rays are so powerful that workers must be protected by aprons and gloves of lead which filter out the dangerous rays. The effects of the rays are here being tested on a guinea pig.

International

CHILDREN UNDER ROLLIER TREATMENT

In Rollier's method of treating tuberculosis, the patients are exposed to liberal doses of outdoor air and the rays of the sun. The sun's rays seem to increase the body's resistance to disease, as well as to cheer the mind. The sun is a remedy, however, to be used with caution, and applied gradually; the eyes are to be properly cared for and sunburn is to be avoided.

SUPERVISION OF WELL BABIES

At the health center in Mansfield, Ohio, mothers of well babies, like this one, are advised how to keep them so, and mothers of sick babies, how to make them well.

THE DIRTY BACK YARD

In the spring time comes the clean-up campaign. First attention should be given to the dirty back yard, a breeding place of pestilence and of the carriers of disease.

Lively Limericks for Little Listeners

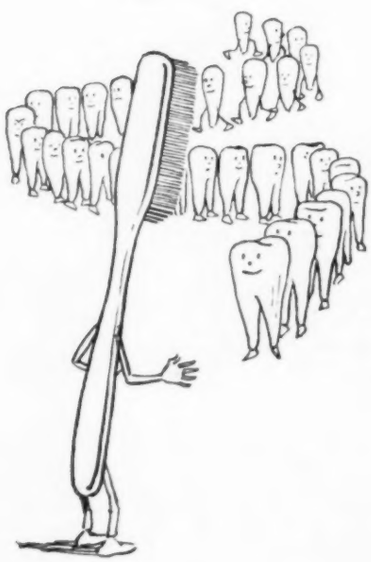
by Mrs. Frederick Peterson

THERE was an Old Man with a tooth
Which ached till he said, "It's the truth,
I neglected 'em young,
And now I am stung,
How I wish I had brushed 'em in youth!"

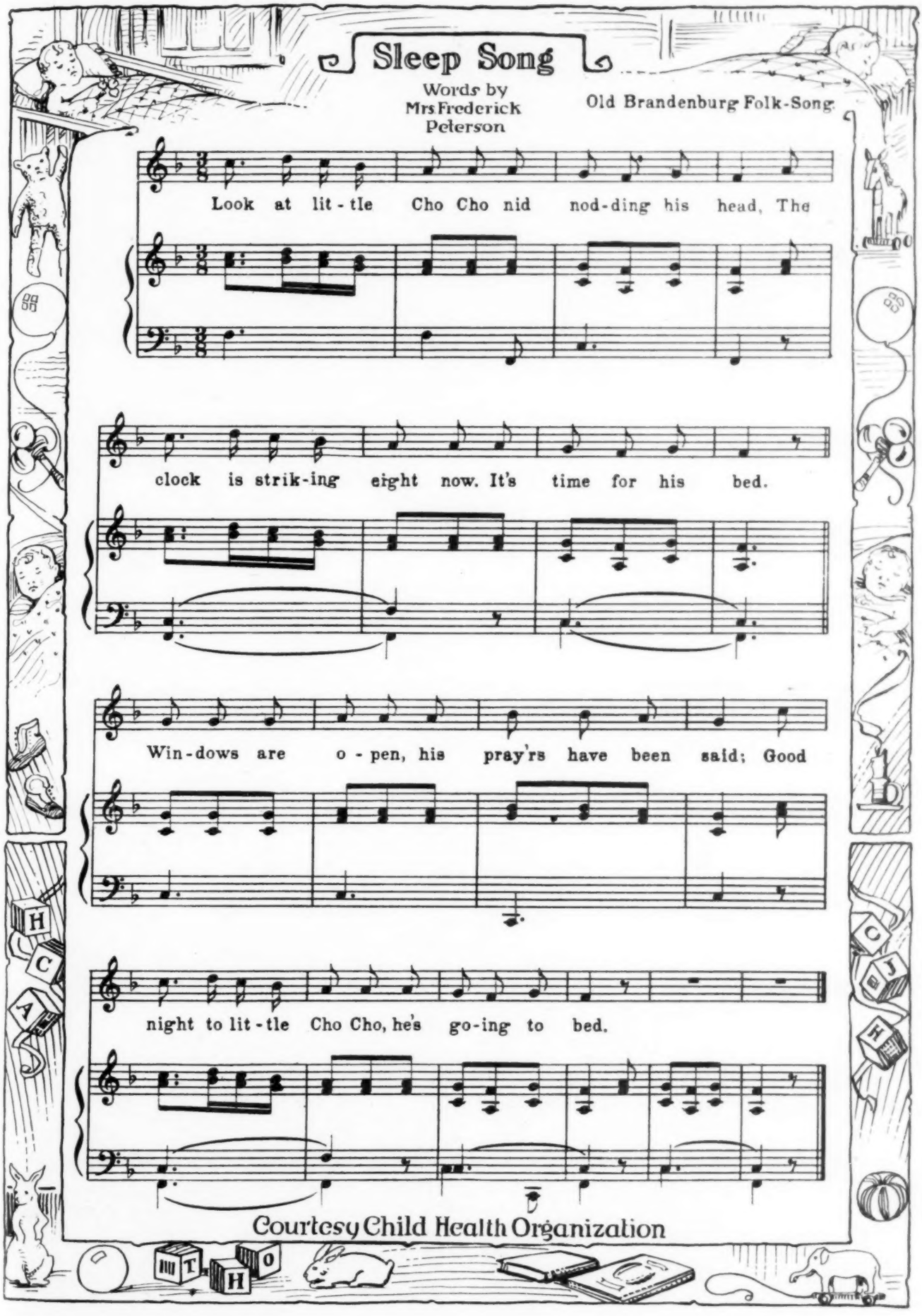
THERE was a Young Person of Spain
Who desired to avoid any pain.
So he carefully chewed
Every mouthful of food,
Which increased that Young Person of Spain.

THERE was an Old Person of wrath
Who wouldn't, would *not* take a bath.
He was put in a tub,
Given soap and a scrub,
Which cheered that Old Person of wrath.

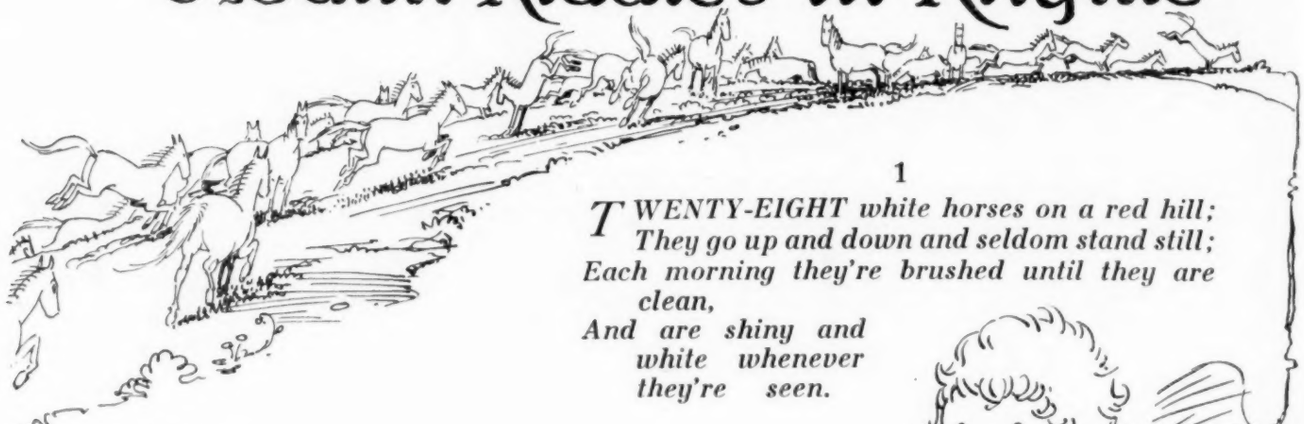
THERE was a Small Boy of Peru
Who jolly well knew what to do.
So he slept with fresh air,
And the fact I declare,
He never took cold as he grew.



HOW many teeth would a Tooth Brush brush
If a Tooth Brush could brush teeth?
A Tooth Brush would brush thirty-two teeth
If a Tooth Brush could brush teeth.

SIMPLE SIMON'S teeth need cleaning
And it plainly shows!
But all the powder he can find
Is on his sister's nose.

Sleep Song
Words by
Mrs Frederick
Peterson
Old Brandenburg Folk-Song
Look at lit-tle Cho Cho nid nod-ding his head, The
clock is strik-ing eight now. It's time for his bed.
Win-dows are o-pen, his pray'rs have been said; Good
night to lit-tle Cho Cho, he's go-ing to bed.
Courtesy Child Health Organization

Health Riddles in Rhyme



1

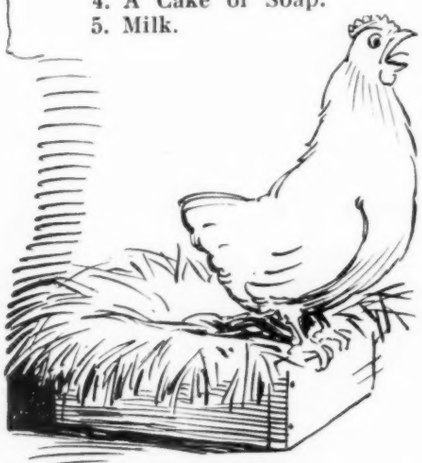
TWENTY-EIGHT white horses on a red hill;
They go up and down and seldom stand still;
Each morning they're brushed until they are clean,
And are shiny and white whenever they're seen.

ANSWERS

1. The Teeth.
2. Candy.
3. An Egg.
4. A Cake of Soap.
5. Milk.

2

A little of it is very good
And children like it as a food;
Between meals it spoils appetite,
But afterward it tastes just right.

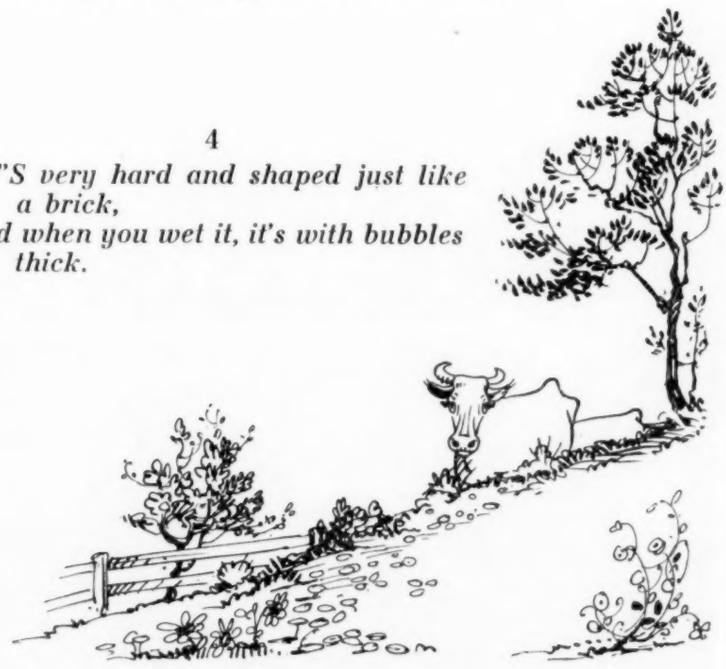


3

A wall of stone surrounds a ball of gold;
Each day it's brought to us upon the table.
The children like it for it makes them grow.
Now who can give this treasure it's own label?

4

IT'S very hard and shaped just like a brick,
And when you wet it, it's with bubbles thick.

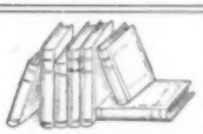


5

WHEN fresh it's a river of white,
When frozen it gives us delight,
When churned it is creamy and yellow.
A quart every day keeps you mellow.

M. F.

BOOK REVIEWS



BLACK OXEN: By Gertrude Atherton. Cloth. Price, $2.00. Pp. 346. New York. Boni and Liveright, Inc. 1922.

Since the time when H. G. Wells predicted the coming of the air ship in the "War in the Air" and since the scientific stories of Jules Verne, scientific novels have increased in number. In fact, the omniscient Slosson is endeavoring to compile a complete bibliography of fiction dealing with scientific subjects in various fields—and their great number must be giving him considerable concern. The most recent addition to the field is a definitely prophetic attempt by one of our most noted woman novelists. These are gland days in the literary world, and Gertrude Atherton is their prophet.

The theme of Mrs. Atherton is a dream which, no doubt, has at times come to the thoughts of every aging person. What man or woman well along in years has not gazed back at a past replete with experience and fondly desired to begin again with the power lent by accumulated knowledge. How many different things one would do and how many things one would do differently!

The modus operandi by which Mary Ogden, the heroine of "Black Oxen," returns to the appearances of youth, while retaining the knowledge of age, is the so-called Steinach method, thinly disguised by Mrs. Atherton as the Leinbach method. Recently many scientific investigators have busied themselves with attempts to bring about rejuvenation, or at least to stand off the grim specter. It was the hope of Voronoff that this might be achieved by the transplantation of generative glands from the higher apes to the human. The late G. Frank Lydston performed transplantation experiments on his own body, using glandular tissues from a recently dead man. It is the theory of Steinach that the same result may be secured by tying off the ducts leading from the male sex organs and thus stimulating the development of the interstitial cells, which he calls the puberty gland, and which he believes are significant factors in maintaining life and bringing about a restoration of degenerating tissues to youthful vigor. However, none of the evidence offered has been generally accepted as sufficiently established to warrant the belief that physical rejuvenation has actually occurred in any single instance, although in some cases distinctly youthful habits of thought seem to have developed with perhaps a corresponding physical response. In other words, conservative scientists are inclined to believe that the reaction is as much, if not more, psychic than physical. This belief seems to be borne out by the fact that one man, on whom Steinach operated and who offered to exhibit himself before a London audience, fell dead on the morning of the lecture. Furthermore, evidence has not been offered by American observers to prove that the life of any person on whom they have operated has actually been prolonged.

It is not desirable that a literary review degenerate into a pro and con scientific discussion, particularly when the subject it concerns is largely con. The basic plot of Gertrude Atherton's story is a love affair between Clavering and the Countess Zattiany, formerly Mary Ogden, a New York belle. Clavering is columnist of a New York daily paper, a clear eyed, cynical, tired newspaper man. Mary Ogden had been the season's most interesting debutante in New York forty years before, and now she suddenly appears as the Countess Zattiany, resembling her former self in all her pristine beauty and passion, and with the wisdom of the passing years. Her past has been replete with affairs of the heart. Her beauty, as depicted by Mrs. Atherton, makes her brilliance cast a deadening shadow on all of the youthful debutantes of the season. Not only Clavering, but also every other young or old man entering into the story falls victim to the attractions of the countess. The scientific aspects of the story appear when Mrs. Atherton permits Mary Ogden to explain to the matrons of her own period, assembled at an afternoon tea, the manner of her rejuvenation. Thus the story:

"Madame Zattiany explained in the simplest language she could command the meaning and the function of the ductless glands. The more intelligent among them looked gratified, for the painless achievement of fresh knowledge is a pleasant thing. Madame Zattiany went on patiently: 'These glands in my case had undergone a natural process of exhaustion. In women, the slower functioning of the endocrines is coincident with the climacteric, as they have been dependent for stimulation upon certain ovarian cells. The idea involved is that the stimulation of these exhausted cells would cause the other glands to function once more at full strength and a certain rejuvenation ensue as a matter of course; unless, of course, they had withered beyond the power of science. I was a promising subject, for examination proved that my organs were healthy, my arteries soft; and I was not yet sixty. Only experimentation could reveal whether or not there was still any life left in the cells, although I responded favorably to the preliminary tests. The upshot was that I consented to the treatment—'

"Yes? Yes? Every woman in the room now sat forward, no longer old friends or rivals, affectionate or resentful, not the victims of convention solidified into sharp black and white by the years. They were composite female.

" 'It consisted of the concentration of powerful roentgen—what you call x-rays—on that portion of the body covering the ovaries.'

" 'How horrible! Did you feel as if you were being electrocuted? Are you terribly scarred?'

" 'Not at all. I felt nothing whatever, and there was nothing to cause scars.' "

All of this description by Mrs. Atherton is probably based on a very simple observation, made experimentally by Drs. Steinach and Holzknecht, which Marshall, an eminent English physiologist describes in a few lines: "When the ovaries in women are subjected to roentgen-ray treatment, the climacteric (menopause) does not supervene and this is regarded as being due to the continued function of the puberty gland." It is a far cry from this simple scientific observation to the imaginative case recorded by Mrs. Atherton. Mrs. Atherton presents us with a woman between fifty-five and sixty who has recovered all the beauty of her glorious youth. Furthermore, Mrs. Atherton selects for the method of rejuvenation the only one that does not involve the production of what may be a rather unsightly scar and yet precisely the very one for which the least is claimed as to its value in producing rejuvenation. It is a far different thing to delay a climacteric than to restore life to deadened tissues. Physicians know

that dead tissues do not recover, and it is generally believed that it is as impossible to restore elasticity to overstretched and degenerated tissues as to produce those qualities in garter rubber that has outlived its usefulness. Not only has Mrs. Atherton gone far beyond any actually recorded observations, but also beyond the most elaborate of theories.

This scientific discussion of Mrs. Atherton's plot should not detract in any way from the worth of her novel. She presents a picture of an effete New York society group which is brilliantly expository and satirical. Her "sophisticates" are a satisfied intelligentsia. They consider themselves the center of a revolving world, which, after all, goes about its business in general rather quietly ignoring them. Her columnist, Clavering, is the apotheosis of "colyum" conductors. Unfortunately, the lines credited to him are not one half so brilliant as those which Heywood Broun, actually a great columnist, credits to his conductor in "The Boy Grew Older." The love affair between the Countess Zattiany and Clavering is intensely interesting because it is so different, and possibly because it arouses the kind of curiosity that attaches invariably to physically mismated couples. That is the long and short of it.

Mrs. Atherton is a clever novelist; she has written a clever story. Whether or not it is scientifically true is, after all, a matter of small concern since it is frankly a well-conceived work of the imagination. And then, when such a writer as A. Conan Doyle can produce a story of similar character, without even the slightest semblance of scientific exactitude —as in *Hearst's International* for March—and get away with it, why criticise Mrs. Atherton? The eminent Doyle was once a scientific physician and now he believes in spirits and fairies.

I Believe in God and in Evolution: By William W. Keen, M.D. Cloth. Price, $1.00. Pp. 102. Philadelphia. J. B. Lippincott Company. 1923.

This little volume is written by the Nestor of American surgery and tells how he reconciled science and religion. He points out that the doctrine of evolution is older than Darwin and is substantiated by many facts, some of which were not known to Darwin when he wrote "Origin of Species." Dr. Keen finds evidences of the descent of man from the lower animals in the comparative structure of man and animals. He tells how he and other surgeons have been able through animal experimentation to relieve man of injuries and diseases which otherwise would have proved fatal. Most of the criticisms which have come from scientists against the teachings of Darwin do not contradict the doctrine of evolution, but question the explanation which Darwin gave for the agencies which have accompanied evolution, and to which the processes of evolution have been due.

The Sexual Life: By C. W. Malchow, M.D. Fifth Edition. Cloth. Price, $3.00. Pp. 317. St. Louis. C. V. Mosby Company. 1921.

This book contains chapters on the sexual sense, sexual passion, copulative function, sexual habits in the married, and the hygiene of sex relations. It is exceedingly difficult to write on these subjects without laying ourselves open to criticism. We have taken unusual pains in the examination of this book and have read it through with great care. We fail to find in it any objectionable statements. It is free from exaggeration, and consists of plain statements about facts which should be understood by all adults, and especially by those about to enter or recently having entered the married state. While the author does not indulge in preaching, the highest moral tone runs through every chapter. Undoubtedly, ignorance of the matters discussed in this book is a frequent cause of marital infelicity.

It is high time that this subject should be rescued from the hands of the class of men who for centuries have fed financially on the ignorance of the public. Malchow's book treats of the most delicate relations of married life in plain language without evasion and without any possibility of misunderstanding. Some readers undoubtedly will object to the plain statements, but we believe that the truth about sexual life even in its fullest details can result only in good. No woman should marry a man unless she is willing to reproduce his kind, and no man should marry a woman unless he is willing to consecrate himself to her. The time has come for the absolute rejection of the double standard of morals with regard to sex. The man demands virginity in his bride and chastity in his wife, and his wife has the same right to make the same demands of her husband. When these demands are fully complied with by both sexes, there will be less infelicity in married life, the happiness of the home will be advanced, and the race will be improved.

The Battle with Tuberculosis and How to Win It: A Book for the Patient and His Friends: By D. Macdougall King, M.B. Cloth. Price, $2.00. Pp. 258, with 8 illustrations. Philadelphia. J. B. Lippincott Company, 1917.

This is one of the good books written by a non-medical man who has found himself infected with the ubiquitous *Bacillus tuberculosis*. Evidently the author has made a careful study of the defensive forces of the body and how to profit thereby. In our opinion great courage has been shown by young men and women who have found themselves infected with the bacillus of tuberculosis. The outcome of the fight against this disease is largely dependent on the intelligence and courage of the infected persons. It is highly desirable that infection be recognized early, and when detected the infected person should set out earnestly to get all the scientific information he can about the disease, and utilize all this information to prevent the spread of the disease from himself to others and in taking care of himself. Within recent years some of the best books that have come out have been written by those afflicted with the disease. Villemin, in the sixties of the last century, demonstrated that the virus of tuberculosis is contained in the sputum and in other excretions of tuberculous men and animals, and pointed out that in order to limit the spread of this disease it is necessary to disinfect or destroy the virus in these excretions. The great mass of the medical profession was slow to appreciate and properly utilize the knowledge placed in their hands by this discovery, and great good from it did not appear until the intelligent public, and especially the victims of this infection, began to apply the knowledge of which Villemin's discovery was the basis.

Opiate Addiction; Its Handling and Treatment: By Edward Huntington Williams. Cloth. Price, $1.75. Pp. 194. New York. Macmillan Company. 1922.

This book is especially suited to those interested in the treatment of drug addicts. The author concludes that the Harrison Narcotic Law has not only been a failure, but also that under it the number of drug addicts has increased and criminality in the sale of opiates has not been abated. The author discusses the relative values of rapid reduction and gradual reduction of the drug in the treatment of this vice, and comes to the conclusion that the supply and distribution of opiates in this country should be placed unreservedly in the hands of the United States Public Health Service.

QUESTIONS AND ANSWERS

If you have a question relating to health, write to "Questions and Answers," HYGEIA, enclosing a two-cent stamp. If the question is of general interest, the answer will be published; otherwise it will be sent by mail. The names of correspondents will not be published.

Poisoning by Zinc

To the Editor:—Kindly give me information concerning the following: Can a man who has been working in zinc dust be poisoned to the extent that he would lose forty pounds in two months, become anemic, have loss of appetite, constant headache, be very weak and have a severe diarrhea? He seems to improve with rest but when he returns to work the symptoms come back. The work is in a rubber factory where he is constantly in contact with zinc dust.

C. A. S., Tennessee.

Answer.—In a list of seventeen poisonous substances used in the rubber industry, zinc is not mentioned in a well known book on industrial diseases. However, the fumes of zinc are commonly encountered in brass foundries, casting shops, brazing processes, and among refiners of junk and dross. In such instances it is reported that these fumes cause symptoms like those of malaria with chills, fever, and sweats, which appear a few hours after inhalation of the dust and continue for some time. While it is impossible to state that the symptoms described in this particular instance were due to poisoning by zinc, the fact that the patient improved immediately on change of occupation indicates that he is susceptible to some factor associated with his work and that it is not healthful for him to continue in this occupation unless protected against the particular factor.

Kolor-Bak

To the Editor:—I have been using "Kolor-Bak Hair Restorer" made by the Hygienic Laboratories of Chicago. If possible, could you send me a list of ingredients used in it? E. L. D., Colorado.

Answer.—"Kolor-Bak" was analyzed in the laboratory of the American Medical Association, and found to contain sulphur and some poisonous lead salts. "Kolor-Bak" has been advertised under the claim that it is not a dye; it *is* a dye. It has also been claimed that "it will restore gray hair to the original color"; it *does not* restore the color, but dyes it. It has been claimed to be "positively harmless"; it is *not* harmless, but contains a dangerous poison.

How Is Syphilis Diagnosed?

To the Editor:—How can any one know if they have contracted syphilis? How can you know the disease when you see anyone with it? Have you any pamphlets on the subject? L. S., Kentucky.

Answer.—The exact diagnosis of syphilis is to be made by a physician who will base his decision on certain definite findings including an examination of the blood, the Wassermann test, and examination of the exuding fluid from the lesion or sore for the presence of the organism which causes syphilis, and which is commonly known as the *Spirocheta pallida.* It would be impossible for the average layman to recognize the presence of syphilis in another by any visible signs. In the secondary and tertiary stages of the disease visible signs occur often, but for accurate diagnosis the opinion of some one trained in the discovery of the disease is necessary. The American Medical Association publishes a book, Syphilis as a Modern Problem, for distribution to the public. The United States Public Health Service, Washington, D. C., also issues numerous pamphlets on the subject and the state health departments in most of the states have available suitable literature.

Meat for Small Children

To the Editor:—My physician has told me that I may feed my two-year old boy a small amount of meat daily. My little nephew's physician does not allow him any meat. Both children are healthy and very active. What is your opinion on the subject?

H. P., Illinois.

Answer.—In our opinion a small amount of meat will not hurt your healthy two-year old child; indeed, it will do him good.

Rich Food and Gallstones

To the Editor:—A year ago I was operated on for gallstones. Six months later, after a long ride and rich food eaten when I was tired, I had an attack similar to those from which I had suffered before operation. I am too far away from the surgeon who operated on me to consult him. Will you please tell me whether this is unusual after such an operation?

P. L., Maine.

Answer.—Your experience is not altogether unique. It is probable that the rich food had more to do with the return of your symptoms than the long ride. In fact, it is more than likely that too frequent indulgence or overindulgence in rich food had something to do with the trouble originally.

Leonard's Ear Oil

To the Editor:—Kindly advise me as to the value of "Leonard's Ear Oil." C. B. S., New York.

Answer.—The chemists of the Department of Health of the City of New York, who analyzed "Leonard's Ear Oil," reported that the preparation consists practically of liquid petrolatum with camphor, eucalyptol, and soft soap. The Department of Health of the City of New York had Leonard arrested and put on trial for making false and misleading claims. In July, 1918, Leonard was sentenced to thirty days in jail or to pay a fine of $250. In April, 1921, the United States Department of Agriculture published a bulletin showing that the claims made for "Leonard's Ear Oil" were false and fraudulent "since the article contained no ingredient or combination of ingredients capable of producing the effects claimed."

Cretinism

To the Editor:—Could I get a book telling of the care and cure of a child two years old with cretinism? If so, kindly advise as to the cost of the book and where I can obtain it.

H. S., Michigan.

Answer.—It is suggested that you consult your family physician as to the diagnosis. Several diseases simulate cretinism, and the diagnosis should be firmly established. If it be cretinism, the condition

may be relieved by proper feeding with thyroid gland from the sheep. The diseases closely resembling cretinism, however, would not be benefited by this treatment. Cretinism is a rare disease. There are medical treatises on this condition, but so far as we know there is no popular work dealing with the care and treatment of cretins. As a matter of fact the condition is too serious for "home treatment."

Vaccination for Smallpox

To the Editor:—Will you please answer the following questions:

1. Why do infections sometimes follow vaccination for smallpox?
2. Are there any authentic cases of serious infection resulting from vaccination?
3. Does the failure to heal for several months and the appearance of sores about the scar indicate infection?
4. Is there any direct evidence disproving the statement said to have been made by Dr. Abrams that cows are subject to syphilis?

Patsy Hughes Lupo, Department of Biology, Rockford College, Rockford, Illinois.

Answer.—1. When infection follows vaccination against smallpox it is due to impure vaccine (very rare), careless administration (more common), or to infection after vaccination (most frequent).

2. They are so few as to be negligible. Recently several millions of people in the Philippines have been vaccinated without a single ill result.

3. Such occurrences certainly do indicate infection, most likely an infection which has resulted from the introduction of germs into the wound after vaccination.

4. Cows have been inoculated with syphilis without developing the disease. The only two animals besides man proved to be susceptible to syphilis are apes and rabbits. Syphilis may be transmitted to apes, and in these animals this disease runs very much the same course that it does in man, but somewhat milder. Certain tissues of rabbits are susceptible to syphilis, and local lesions of syphilis can be produced by inoculation into these tissues. General infection with syphilis in rabbits has never occurred, although thousands of these animals have been inoculated.

Viavi

To the Editor:—I am writing you at the advice of my physician for information about "Viavi," used a great deal for female trouble, but said to be good for everything. Any information concerning this will be appreciated. W. H. S., Ohio.

Answer.—Detailed information on "Viavi" would occupy more space than this department can give. If you will send for the pamphlet "Female-Weakness Cures" (price fifteen cents) published by the American Medical Association, you will find that the first article in this pamphlet deals with "Viavi."

Periodic Examinations

To the Editor:—My little girl three years old has been under a physician's supervision ever since she was born. She is very healthy, however, so I feel that examination more than once a year, provided that she is not ill, will now be enough. But I do want some guide for feeding her. What book or pamphlet would you suggest? B. T., Ohio.

Answer.—Much can happen in a year. In our opinion, children should undergo a health examination at least once every six months. There are a number of good books, any one of which will aid you in looking after the health of your little girl. One of these books was reviewed in the April issue of HYGEIA: "Nutrition and Growth in Children" by R. P. Emerson, M.D. Price, $2.50. New York City. Appleton and Company.

Pleurisy

To the Editor:—Have you a pamphlet or anything on side pleurisy or pleurisy of the side? If so please let me know the price of the pamphlet.

M. E. F., Tennessee.

Answer.—"Side pleurisy" differs in no way from any other kind of pleurisy. It is best for you to consult your family physician to be sure that your diagnosis is correct.

Transplantation of Glands

To the Editor:—So much material on gland transplantation has appeared in the papers recently that I am interested to know just how much truth there is in the theory of rejuvenation by transplantation of glands. Can you tell me?

A. M., New York.

Answer.—Dr. W. B. Cannon in his valuable article in the April number of HYGEIA has pointed out as accurately as can be done at the present time the facts known concerning the transplantation of glands and the use of the extracts of glands. While the cretinous child may be restored to physical and mental normalcy by feeding the extract of thyroid glands, there is no available proof that in transplantation of glands the fountain of youth has been discovered.

Social Origin of Prostitutes in New York City

To the Editor:—Can you tell us from what class the prostitutes in New York City are recruited?

M. S., New York.

Answer.—Katherine Bement Davis, who has made a most thorough study of prostitutes in New York, gives the distribution of birth as follows: American born white, 62.55 per cent.; American born colored, 13.14 per cent.; foreign born white, 24.11 per cent. It is evident from these figures that the American born furnished the larger group, but a different showing is indicated when we come to the parentage of prostitutes, this being distributed as follows: Foreign parentage, 51 per cent.; American parentage, 29.06 per cent.; mixed parentage, 12.37 per cent.; unknown parentage, 7.57 per cent. So far as educational qualifications were ascertained the distribution was as follows: No education, 7.72 per cent.; did not finish primary grades, 45.32 per cent.; entered, but did not finish, grammar grades, 39.72 per cent.; finished grammar grades, 7.24 per cent. In religion, the distribution showed that each of the great religions in the city furnished its quota: Catholic, 41.1 per cent.; Protestant, 38.9 per cent.; Jewish, 19 per cent.; no record, 0.09 per cent. Place of birth and rearing showed the following figures: New York City, 59.20 per cent.; other cities, 23.28 per cent.; country, 17.47 per cent. The great majority of procurers, pimps, cadets and others engaged in the business, were foreigners.

Othine

To the Editor:—Will you kindly inform me the value of "Othine" for the removal of freckles.

W. D., Colorado.

Answer.—The state chemists of Connecticut, Indiana and Kansas have analyzed "Othine." The active drug in "Othine" is ammoniated mercury, a powerful caustic poison.

HEALTH REVIEWS

HEALTH IN CURRENT MAGAZINES

"INSOMNIACS I HAVE KNOWN"

Dr. Josephine A. Jackson, author of the popular treatise "Outwitting Our Nerves," contributes to the *Woman's Home Companion* for March the third of a series of articles on the proper hygiene of the nervous system. The present article is entitled "Insomniacs I Have Known." In this, as in most of the material which Dr. Jackson has published, is found a combination of simple psychology and a leaning toward Freudianism. "The insomniac," she says, "like all his connection in the family of nervous folk, owes his predicament to an excess of misdirected energy. Instead of being 'too used up' to sleep, he is kept awake by his lively interest in himself." Dr. Jackson considers that the patient with insomnia is too intent on himself. She does not refer to the patient who is sleepless because of organic disease, but only to the one who fails to sleep because of a bad mental habit. "It is the purpose of this article," she says, "to prove that the thoughts of the true insomniac are the work of the tireless-easy-going involuntary subconscious mind, and are therefore a harmless pastime, when considered from the standpoint of physical health. . . . Insomnia proves often to be a game between the wily subconscious ego on the one side, and the various healing measures that are offered on the other. To prove refractory to the drugs of the M.D., the rubs of the D.O., the allurements of the change of scene, and the martyrdom of the ten-mile walk is really a notable achievement. There will soon be new victories to record over even the newest device of all, the seductive influence of a twenty knotted string, which all the world is fingering, each knot a full-length portrait of the ego: 'I am getting better and better.' Alas! to be cured would bring an end to a favorite pastime. To the really disillusioned insomniacs," concludes Dr. Jackson, "just this one word! Let go your needless apprehension; turn your thoughts outward; lie quiet on your bed; and sleep will be yours."

BETTER BABIES' BUREAU

Another article in the *Woman's Home Companion* is by Margaret W. Richards, and it is entitled "A 'Better Babies' Bureau.'" Instead of having anything to do with a government department in Washington, D. C., it concerns the method of building a bureau for babies' clothes. The magazine offers to send the pattern on receipt of twenty cents.

TWILIGHT SLEEP

In *McClure's Magazine* for March, Ruth Hale gives impressions of her personal experiences with the so-called twilight sleep. It was in 1914 that *McClure's* undertook to sponsor a campaign for the adoption of this innovation as a routine method. The campaign failed regardless of the efforts, described by Miss Hale, of Mrs. Richardson and herself. There seem to be only two logical reasons for taking this matter up again, that Miss Hale, who really is Mrs. Heywood Broun, but at the same time a Lucy Stoner and therefore anxious to be known as Ruth Hale, wishes to write an article, and that *McClure's Magazine* needs some sort of propaganda and finds this one wandering around loose. Physicians, at least, have settled this matter to their own satisfaction. They prefer to use various narcotics and anesthetics, as they believe them to be indicated, and not to be bound to any fixed routine as the result of some misguided propaganda.

ARTIFICIAL ARMS AND LEGS

In the *American Magazine* for March, H. J. Murphy conveys a message full of cheerfulness for those who have lost a limb through accident, and wish to "carry on" with an artificial one. Mr. Murphy wears two artificial legs. In his article he describes numerous instances in which handicapped persons have been able to live fairly normal lives through the highly developed artificial limbs which can now be obtained. The article is profusely illustrated with pictures of normal looking cripples in action.

HOW A DEAF PERSON FEELS

Carolyn Wells, well known as writer and humorist, tells—in the March *American*—her own experience with deafness. Her article is marred by several scientific inaccuracies. For example, she conveys the impression that on one occasion hot wires were passed through her nose and seared her brain; she seems to see no value in trained lip-reading; and she has been offered some sort of theory to the effect that her deafness is due to loose ear drums, a rather impossible conception. From a psychologic point of view her story is important, and, needless to say, it is well written.

HEALTH OF THE SCHOOL CHILD

The *Delineator* for April adds another important article to its series, "Scientific Baby Care." It has already issued in pamphlet form three excellent papers: "The Expectant Mother and the New Baby" by Dr. Ralph Lobenstine, and "The General Care of the Baby" and "Maternal Nursing" by Dr. L. Emmett Holt. In the April article, Dr. Lucas emphasizes the need of an ample allowance for sleep, varying from twelve hours from the ages of six to eight to from nine to ten hours from the ages of twelve to fifteen. He provides a good schedule for outdoor exercise for the school child, periods averaging from two to four and a half hours daily. The remaining portions of the article are rather general considerations of food, bathing and general hygiene.

THE PLAGUES OF EASTERN EUROPE

Royal S. Copeland, formerly health commissioner of New York and now a United States senator from the state of New York, describes in the *Ladies' Home Journal* for March the measures which he believes should be employed to check the advancing plagues of eastern Europe. Senator Copeland recently returned from a trip through eastern Europe, where he was appalled by what he saw of the ravages of typhus and cholera. He believes that we must isolate Russia medically to restrain the progress of the plagues, and that "we must send a medical expeditionary force to hold inviolate a quarantine line," if we are to prevent the spread of these diseases to the United States.

THE INFECTIOUS DISEASES OF CHILDHOOD

Dr. Emelyn L. Coolidge, attending physician in diseases of children to the society of the Lying-in

Hospital of New York City, conducts a regular "Correspondence Course in Mothercraft" for the *Pictorial Review*. In the March number, she considers the infectious diseases of childhood, measles, scarlet fever, whooping cough, German measles, chicken pox, mumps and diphtheria. Her advice is in general sound and practical; moreover, the facts are stated simply and succinctly.

HOUSEKEEPING FOR THE COMMUNITY

Under this title, the *Pictorial Review* for March publishes a large number of prize letters received from various persons concerning methods of enriching community life. Of particular interest from the point of view of health is the description of a day nursery at Mayaguez, Porto Rico.

FOOD FOR THE CHILD

Dr. E. V. McCollum and Nina Simmonds, in *McCall's* for March continue their series of articles on diet for health; they emphasize particularly the need of a proper diet to aid the development of the teeth.

HINTS FOR THE GROWING CHILD

In a brief article full of aphorisms, Dr. Charles Gilmore Kerley, in the March *McCall's*, directs attention to many significant points to be borne in mind when providing for children who are growing. He presents an excellent table of heights and weights at different ages.

THE "HEALTH BUILDER"

A catechism for the expectant mother is a feature of the *Health Builder* for March. In simple language sixteen questions likely to interest the expectant mother are answered briefly and accurately. A practical article by Roy Mason concerns the interesting subject of life expectancy, pointing out that the term of life expectation has been steadily increasing during the last score of years. Summer camps are discussed in an excellently illustrated contribution. Dr. Arthur F. Coca provides an essay on hay fever and bronchial asthma. It is stated that 85 per cent. of persons suffering from seasonal hay fever and asthma can be made either quite free from symptoms or relatively comfortable by modern methods of treatment. The special article of interest to country residents is entitled "How to be Healthy though Rural." Dr. Wm. M. Carhart gives fundamental facts on the hygiene of the eye and Dr. Casimir Funk and Dr. Benjamin Harrow argue for foods as opposed to vitamin tablets. A practical article by Josephine A. Marshall tells the business woman how to keep fit.

"TEN BOOK" ISSUED IN MAINE

An interesting health document has just been issued by the Maine Public Health Association and the printing of 30,000 copies has been arranged for by the Metropolitan Life Insurance Company, New York City. The book is entitled "The Ten Book." It deals with ten subjects of vital interest to health promotion, and under each heading are ten aphorisms describing the main features under each heading. The special subjects concern the family physician, the public health nurse, social hygiene, mental hygiene, child hygiene, builders of Maine, the body, the eyes, the teeth, cancer, and tuberculosis. A few excellent aphorisms are quoted:

A medical examination often discovers unsuspected impairments or diseases and enables corrective treatment which may check them, if not cure them. Regular medical examinations save health, time and money.

The number of innocent victims of social diseases is probably as great as the number of persons who contract them as the direct result of personal immorality.

One baby out of ten born in Maine dies before the end of the first year. In other words, nearly 2,000 Maine babies die each year before they have learned to walk.

If you neglect the teeth of a mowing machine, they will rust. If you neglect your own teeth, they will rot.

A thorough medical examination of all our people once a year would probably cut the deaths from cancer in half.

FIRST-AID MANUAL FOR POST OFFICE EMPLOYEES

Dr. Hubert Work, just before his transfer from head of the Post Office Department to the position of secretary of the interior, issued a manual entitled "First Aid for Postal Employees." The book was prepared through cooperation with the United States Public Health Service under the supervision of Past Assistant-Surgeon R. C. Williams. The manual has twenty-four pages, is of pocket size, and is, without doubt, one of the safest booklets of its kind thus far prepared for the public. The advice is invariably simple and cautious, and limited to such measures as the ordinary person of average intelligence might very well understand. In addition, each post office throughout the United States has been furnished with a first-aid emergency chest, one hundred and fifteen large outfits going to the larger post offices and two thousand smaller outfits to the smaller offices and railway terminals.

GAMES FOR CHILDREN

"A Brief Manual of Games for Organized Play" has been issued by the Children's Bureau of the United States Department of Labor. It was prepared especially for distribution in Porto Rico, but it will probably also be found of value in the states. The workers from the bureau found that Porto Rican children have not enjoyed the group and team play popular with youngsters in this country. Consequently, recreational features have formed an important part of the activities of the bureau, and have helped to win the cooperation of parents, teachers, and citizens in other phases of the work. The manual includes descriptions of seventy common games, for younger and older children, grouped as schoolroom and as playground games. A brief introduction on how to teach games, a list of reference books, and suggested programs of games are added. Many American parents, playground workers, teachers, and leaders of boys' and girls' clubs will find the manual of service.

DEATH RATE FROM CHILDBIRTH

Fewer mothers in the United States died in childbirth or from causes due to childbirth in 1921 than in any year since 1917, according to the records of the Bureau of Census. In 1915, the death rate for the nine states and the District of Columbia which constituted the "birth registration area," was 6.1 for each 1,000 live births; in 1916, 6.2; in 1917, 6.3; in 1918, 8.9; in 1919, 6.8; in 1920, 7.6, and in 1921, 6.5. The relatively high ratios during 1918, 1919, and 1920 were largely due, no doubt, to the epidemics of influenza which took heavy toll of pregnant women. In 1921, the lowest death rate from causes due to childbirth—figures are available for only twenty-one states—was 5.3 for each 1,000 live births (Connecticut), the highest, 9.8 (South Carolina).

Oh! Very Well

Thoughts by the Way

One pair of rats will produce a progeny of over 650,000 in three years, according to a scientific bulletin, and yet the ant has always been cited as the model of a busy animal.

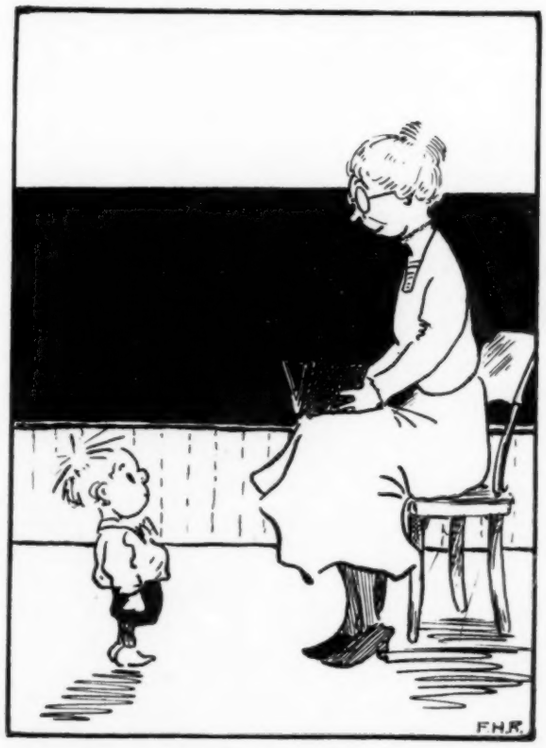
When lovely woman stoops to folly she wears sixteen pounds of fur in summer.

The fly you swat ne'er flies away,
To come and bite some other day.

The thunder rolled, the lightning flashed,
The water drenched the window pane,
With each new deluge, thunder crashed,
And still the farmer prayed for rain.

The question of predetermining sex is still a matter for debate by the biologists, but long ago an old philosopher said: "Boys will be boys."

ANATOMICALLY SPEAKING



Teacher: "Now, Clarence, can you tell me how the early Egyptians buried one of their dead."

Clarence: "Yessum, they put 'im in his esophagus."

IN THE GOOD OLD SUMMER TIME

Winter Guest (in wilds of New Hampshire to keeper of country store).—Have you any tooth brushes?

Storekeeper.—No, we don't keep any of them summer novelties.

IS THAT SO?

An only child is like a favorite pimple—it gets too much attention.

A GOOD CONVINCER

Drawn by W. O. WILSON + A. C.

When the man who doesn't believe in doctors gets a real pain.

Courtesy of Judge.

WHEN TWO ARE A CROWD

A Rhymed Review

THE PHYSIOLOGY OF TWINNING. By Horatio Hackett Newman, University of Chicago Science Series.

His hypothesis is daring;
He starts boldly by comparing
All the data from the first invertebrate;
And he finds throughout creation
Sad paternal agitation
At unlooked for duplication by the mate.

Star fish in the bounding billow;
On the land the armadillo,
All the birdlings of the barnyard and the air,
Show this startling eccentricity,
Of all feminine duplicity
The hardest for a trusting male to bear.

Pithecanthropoids protested,
The Neanderthal man jested
On this curious phenomenon of twinnings;
Yea, this tendency to double,
Call 'em blessings, call 'em trouble,
Was grounded in the very first beginnings.

Keith Preston.

A FABLE IN SLANG

Wunstuponatime there was a wise gazabo who knew all about everything; what this guy didn't know wasn't. He could explain anything; the less he knew about something the better he could explain it. Around the shop where he collected every Saturday night he was known as the walking encyclopedia, and he took so much pride in his reputation that he used to spend most of Saturday afternoon reading the volume marked WUP—ZET so he could converse with fluency on the Yangtze River on Monday. At home his better two-thirds was afraid to peep for fear Sir Oracle would produce a four-hour filibuster, and catch her flat-footed. When this victor began to scratch, any other monologist was a total loss. One day he fell ill of a fever. They deposited him among the eiderdown, covered him with what it had taken four sheep two years to raise, and tingalinged for the local Esculapius. When the savant matriculated, the tonsil exerciser besought an explanation of his unusual symptoms. S. Q. replied: "Hyperpyrexia is the thermal response resulting either from an unwonted stimulation of the cerebral center dominating the mechanism controlling the exchange between the surrounding ether and the circulatory system as represented by the capillaries and the vasomotor control of the larger vessels or else a dehydration phenomenon arising from an unbalanced fluid intake-outgo." At this stage in the proceedings the orator of the first part found himself completely tongue tied, his eyes rolled upward and he gasped for breath. Now he is known as the village dumb-bell.

MORAL: *A house painter has no business studying high art.*

USED TO A QUIET NEIGHBORHOOD

Bath (N.Y.) Plain Dealer.

The remains of William H. Faulkner were brought here from Binghamton Tuesday and buried in Grove cemetery, where he has lived for 50 years.

CONCERNING GLAND TRANSPLANTATIONS

"The transference of monkey glands to human beings, for the purpose of rejuvenation," said the professor, "should prove a baboon to society."

"That would be one way of reaching the ape—x of one's career," responded the poet.

"I think you go—rilla too far," interjected the German savant.

"I'm gland I'm not interested," concluded the humorist.

A COMMENT

He'll have no mercy at our hands,
Who mentions interstitial glands.
We do not care to read the notes,
On glands transferred from sheep or goats,
For who would care to live always,
If these are types of future days.

TELEPHONE STATISTICS

According to the latest estimates, there are over eighty million telephones used in various parts of the world. Allowing 8,473 off for automatic phones, the words "wrong number" are repeated 5,732,876,549 times annually. The words "line's busy" are repeated 4,567,890,123 times annually. Next to "line's busy," the words ——— ——— ——— ——— are most frequently used.

A WISE ANSWER

"Doctor, as soon as I get through with my meals, I feel awfully sleepy. What should I do so as not to go to sleep at the table?"

"Go to bed immediately."

Wide World

Callisthenics Keep Bathers in Form

Buck, brothers, buck,
Buck with care,
Tumble on the sands while the bathers stare;
Feet way up while the head goes down,
Turn way over till you bump your crown.
Buck, sisters, buck,
Buck with care,
Tumble on the sands and forget your hair.

A MOSQUITO TRIOLET

He presented his bill,
And I could not evade it.
In valley, on hill,
He presented his bill,
With stinging ill-will;
So with blood, sir, I paid it.
He presented his bill,
And I could not evade it.

A. Anderson.

FAMOUS HAMS

Birmingham.
Ham and eggs.
Alexander Hamilton.
Al Jolson.

Welcome, Sweet Spring Time

It is the merry month of May,
The golfer now begins to play,
On Sunday he'll no longer pray,
His back dues now he'll quickly pay,
"I had a six," you'll hear him say,
Unto the links he's on his way,
It is the merry month of May.

(Continued on adv. page 10)

For

Baby's health—Milk Sugar Merck

Merck Baby Products

Milk Sugar Merck
Barley Flour Merck
Zinc Stearate Merck
Talcum Powder Merck
Boric Acid Merck
Liquid Petrolatum Merck
Sodium Bicarbonate Merck

Ask your doctor

—a natural baby food for making modified milk.

Of the highest purity and long recommended by physicians.

In Merck's sealed canisters

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At your druggist's

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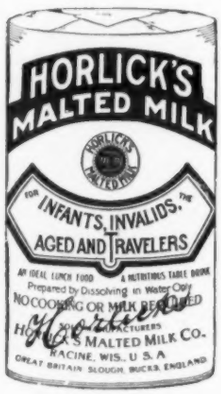
A HEALTH FACTOR IN MANY HOMES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MALTED MILK
FOR INFANTS, INVALIDS, THE AGED AND TRAVELERS
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Strengthening and healthful as a table beverage. Useful in nervous, anaemic and digestive disorders and as an upbuilding nutrient generally. Reliable in the feeding of infants and growing children.

Serve "Horlick's" at the table. Avoid imitations at the fountain.

Sample and literature prepaid on request.

HORLICK'S
Racine, Wis.

OH! VERY WELL!

(Continued from page 132)

DR. PEPYS' DIARY

March 16.—Reading in ye press of a damsel who hath overmuch of temperature and it seemeth ye press maketh a great hullaboo thereat, and well they may, for, indeed, if ye lady be as hot as is spoken, she is ye warmest that hath yet appeared in this clime. More especially is ye tale to be wondered at for that she resides in ye most northern part of ye country where, at this season, ye whole country is locked in snow.

March 19.—This day ye press full of ye tale of how ye damsel hath committed a hoax and that ye temperature be naught but that of a vessel filled with hot water which she hath concealed about ye bed. Now indeed ye whole country doth laugh at that which was before a subject for marvel; so considering, I must needs be constrained to think of ye old saw that "familiarity breedeth contempt," and to be reminded again of ye old fact that ye unknown is always mysterious and ye wonderment of ye populace. Now forsooth all do comment wittily on ye revealment of ye hoax, but none so witty as this: One of ye physicians hath written that ye way to cure ye damsel would be indeed to place her over ye knee and apply forcible correction to ye presenting portion of ye anatomy; thereat hath a columnist written that this would be indeed one way to get at ye bottom of ye mystery.

EDUCATION: A MODERN VIEW

FATHER *(to son home from boarding school, who had been taken to see Guitry's play "Pasteur").*—"The play was highly educational."

SON.—"I didn't think so. It didn't bore me a bit." G. L.

ETHIOPIAN PHILOSOPHY

It isn't every one who has the philosophy of life expressed by a colored maid of all work, who, by the way, owns to the name of Lovey Dear. She was busily chasing the elusive dust and soot Saturday afternoon at the home of a woman who found that day her only one of leisure for household duties.

"I certainly am glad," she said, "to find some one who will work on Saturdays."

"Well," replied Lovey, "I wants work. And them as wants work has to work at the time them as wants 'em, wants 'em to work at." And that seemed to cover the situation.—*Indianapolis News.*

The Old Ones Are the Best

A man named Day married a Miss Weeks. The best man at the wedding recited the following poem:

A week is lost,
A day is made,
But time need not complain,
For soon there will be days enough
To make a week again.

WORSE AND WORST

A Scotchman and an Australian were discussing the conditions in Scotland and the commonwealth.

SANDY: "Understand there are a great many Scotties in Australia."

ANZAC: "Yes, but the worst feature is the rabbits."

TONIC

March has gone out like a lion,
Spring clothes now the folks are buyin',
Plants are growin', not adyin',
Flies about will soon be flyin',
Baseball guys for hits are vyin',
Story tellers practice lyin',
Funny men the folks are guyin',
Booze hounds still are gently dryin',
Golfers now begin a tryin',
Spring has came, there's no denyin'!

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